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MARKET OUTLETS FOR CANADIAN CRUDE OIL:  
PROBLEMS AND PROSPECTS

W J Levy  
Lupton

W. J. LEVY, INC.  
NEW YORK




1. Price in Alberta
  - ⓐ of duty
  - ⓑ of quota
2. Last para. Cost memo.
3. Effect of Lawrence ~~away~~
4. Have you made any special comparative study of Can. paper tree rates - are they relatively high?



# MARKET OUTLETS FOR CANADIAN CRUDE OIL: PROBLEMS AND PROSPECTS

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30 Rockefeller Plaza  
New York 20, New York  
December 1957



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# MARKET OUTLETS FOR CANADIAN CRUDE OIL:

## PROBLEMS AND PROSPECTS

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\* Bound in separate volume.







## SUMMARY AND CONCLUSION

1. Any study on the prospects of the Canadian oil producing industry must begin with certain judgments about its underground resources. Such judgments would, of course, be conjectural; final answers are still hidden in the earth. But on the basis of present indications, it can safely be assumed that Canada's oil resources are substantial, although not so prolific as, say, in the Middle East. Furthermore, Canadian oil will tend to be subject to rising costs of exploration and development in the future, as is the case with U. S. oil.
2. Canadian oil cannot, therefore, expect to compete for overseas markets with foreign supplies that are drawn from seemingly bottomless reserves and whose replacement costs are relatively low. However, Canada and the United States together constitute a tremendously large market for petroleum products, with an expected rate of growth that exceeds the apparent productive potential of the two countries combined. Thus, Canada's recently discovered and still expanding oil resources should be in a position to contribute substantially to future requirements in North America.
3. This prospect, however, involves an uncertain future. And while a basic strength of Canadian oil lies in its location, that location poses exasperating problems and issues at the present time.
4. Initially, Canadian crude found its market outlets close at hand in the Prairie provinces. Being more favorably situated than the U. S. crudes (and products) that had supplied the area, Canadian oil was able to command a relatively high wellhead price. With the rapid development of reserves following the Leduc and Redwater discoveries, however, Canadian crude had to seek additional and more distant market outlets. But Canadian crude, by virtue of its interior, land-locked location, couldn't trickle into the more remote refining centers. It had to be delivered by pipeline in large and continuous flows -- and at prices that were competitive with alternative sources of supply. Transportation and effective price competition thus became closely interrelated. In consequence, Canadian wellhead prices were bound to reflect (a) wellhead prices of competitive crudes, (b) relative transportation costs of Canadian and competitive crudes, and (c) the foreign exchange rate on Canadian currency. Thus, when Canadian crude reached Sarnia in April 1951, Canadian wellhead prices were sharply reduced (29 to 44 cents per barrel) in order to meet the competition of U. S. crudes and taking into account the pipeline charges that were involved.







5. Since 1951, Canadian crude has extended its market frontier in several directions. In the east, it moves to refineries in the Toronto area. In the U. S. Midwest (Minnesota-Wisconsin), it has been able to establish itself where U. S. crudes could move only via roundabout means of transportation. In the west, Trans Mountain Pipe Line brought Canadian crude to British Columbia, and then to the Puget Sound area where product requirements had previously been met by northward shipments from California and where new refineries were constructed to operate on Canadian supplies.

6. Meanwhile, the development of Canadian reserves and productive capacity continued at a rapid rate. Significantly, in recent years, the rate of development exceeded the rate of growth in requirements for Canadian crude within the market area in which it had established itself. Thus, the Canadian oil producing industry now finds itself operating at around 50 per cent of capacity. Drilling activity has slowed down, and the incentives for future resource development are threatened.

7. This experience of recent years poses forcibly the basic problem of the Canadian oil producing industry. There is, on the one hand, a rate of development that could be supported by Canada's physical resources. On the other hand, the trend in Canadian crude oil production is determined by growth in requirements within the market area it serves. If the economic prospects that depend on markets and production are limited, then the Canadian oil industry may not be able to realize fully the growth potential that is inherent in its physical resources. For a time, the producing industry could continue to operate at low rates of capacity. Inevitably, the rate of development will be retarded, as incentives for continued exploration and development are impaired.

8. Looking ahead, we review the probable demand for Canadian crude in the refining centers in which Canadian crude has established itself. Over the years immediately ahead, a combination of circumstances could tend to influence favorably Canadian crude requirements. A projected expansion in Canadian refining capacity should permit a higher degree of product self-sufficiency. The extension of Interprovincial to Toronto could solidify the position of Canadian crude in eastern Ontario. Finally, announced expansions in the capacity of refineries in Washington, Minnesota and Wisconsin would increase the potential U. S. demand for Canadian crude. Recent economic developments, however, becloud the near-term outlook. Oil requirements were adversely affected by a retardation in business activity during 1957, and the prospects for 1958 are not more encouraging. There are further uncertainties associated with U. S. import policy. Thus, the full effect of these favorable trends may not be realized





until some time in the early Sixties and the Canadian producing industry could face further years of greatly restricted output.

9. Beyond that date, the demand for Canadian crude will be largely confined to the annual increases in product demand within its watershed. Some additional gains would probably be made in U. S. export markets that are currently being reached. But in the absence of a major expansion in the flow of Canadian crude to the United States (which is reviewed below), the rate of increase in Canadian production would be further retarded. On balance, the demand for Canadian crude could approximate 1,000,000 barrels per day by 1965.

10. Predictions of future reserves and productive capacity are subject to a wide range of familiar uncertainties. Exploratory efforts are affected by a host of factors, including finding prospects, costs, prices, market outlets, tax policies, etc. -- all of which contribute toward the shaping of "incentives" for oil operations. And actual results, from time to time, may not conform too closely to efforts, depending on the fortunes that play so important a role in oil prospecting. Over the long run, however, it will be Canada's physical resources that will -- with the right incentives -- determine the levels of reserves and production that could be obtained.

11. The Royal Commission's study on Canada's Energy Prospects, and the consensus of industry opinion, project the level of production at around 3,000,000 barrels per day in 1980. By linking the record of past experience with long range estimates of reserves, capacity and production, a trend of potential Canadian crude oil production over the coming years can be traced out. But the probable levels of production which present markets for Canadian crude would make possible through about 1965 appear to fall considerably below the potentials that Canadian resources might support. By 1965, the gap is likely to be some 500,000 barrels per day.

12. To the extent that the prospects for Canadian crude in existing markets fall short of levels of production that Canadian resources might potentially support, the opportunity for a more favorable performance would depend on the possibility of extending the marketing perimeter of Canadian crude. This could involve a major expansion of refining capacity along the perimeter itself, operating on Canadian crude with products capturing an increasing share of the area's watershed. Or it could involve reaching out to the next large refining complexes: i. e., San Francisco in the west; Chicago or Detroit-Toledo in the south; or Montreal in the





east. In each case it would entail intensified competition with the main stream of U. S. crudes or of low-cost foreign crudes.

13. An expansion of market outlets for Canadian crude would obviously mean the opportunity for increased production and a new fillip to the development of the producing industry. However, it would also involve, as in the past, certain costs in order that Canadian crude establish its competitive position against other supplies. More significantly, commercial considerations of major refiners in these potential markets will pose added difficulties against the flow of Canadian crude. And the export market in the United States would depend in large measure on the course that U. S. import policy is likely to follow.

14. A natural outlet for Canadian crude would be on the U. S. West Coast. Canadian oil is now supplying refineries in the Puget Sound area, with further expansion projected. And the West Coast, which is already a deficit area, is expected to require increasing imports in the future to supplement local production. Canadian oil would be competitive with Venezuelan or Eastern Hemisphere crudes, considering respective f. o. b. prices and normal transportation costs, as far south as the San Francisco Bay area. A reduction in Trans Mountain rates at expanded throughput to about the level indicated in its original prospectus would permit Canadian crude to achieve a pro forma cost advantage even at very low tanker rates for overseas supplies.

15. But these conditions have been as true of the recent past as they would be in the near future. Yet Canadian crude has not been able to establish itself as a regular source of supply for California refineries; off-shore liftings at Vancouver have been confined to those occasions when access of California refiners to other foreign supplies has been interfered with, as by the tanker shortage during the Suez crisis. The major refiners on the West Coast are affiliated with integrated companies, all owning vast reserves in the Eastern Hemisphere and most having a strong position in Venezuela. In these overseas areas, reserves are established and replacement costs low. Owned-production, or even long-term purchase arrangements, mean greater over-all profits. In contrast, a West Coast importer can only get access to Canadian (Alberta) crude, because of prorationing among all producers, by taking purchased oil ratably along with owned-production. Thus, given a choice among foreign crude sources, these companies will probably continue to prefer other foreign supplies to Canadian oil.

16. The competitive status of Canadian crude at Puget Sound is, of course, strong; but even there it is not an assured position. Recent





discoveries in Washington and Alaska could mean a substantial flow of U.S. oil which would tend to displace Canadian supplies if and when it reaches sizeable proportions. Also, the commercial preferences of U.S. companies, indicated above, will play a role in determining the rate of refinery expansion in the area (as against California) and the source of that area's crude and product supplies.

17. The United States is about to establish restrictions on the level of crude oil imports into the West Coast beginning in 1958. A lag in domestic demand coupled with new pipeline connections from the Southwest have reduced the volume of supplemental supplies required from foreign sources; and individual importers are being asked voluntarily to limit their receipts of foreign crude, but are left free to select from among alternative sources. While U.S. import policy is apt to evolve in the future according to changes in the West Coast supply-demand balance, the obstacles posed by commercial preference for Eastern Hemisphere crudes could be magnified so long as low cost crudes are pressing for a limited market outlet within a U.S. import ceiling. Thus, Canadian crudes are only likely to achieve an expanded and assured flow to the U.S. West Coast if Canadian oil, by virtue of its location and interior pipeline connections, is given a preferential status along with U.S. domestic crudes.

18. In the U. S. Midwest, Canadian crude would have to establish a position against the main stream of domestic crudes. To reach major refining centers, it would have to equalize at a lower delivered price, incur an added transport charge, and absorb the U.S. duty -- all of which amounts to a competitive disadvantage upwards of 10 cents per barrel, depending on the market area. If competitive equality could be achieved, via reduced wellhead prices or pipeline rates, Canadian crude might then face less formidable obstacles on the part of individual companies than on the West Coast. U.S. crude production in major producing areas is pro-rated much the same as Alberta crude, so that the factor of owned vs. purchased oil would tend to be less critical. Furthermore, most Midwest companies are active in Canadian oil development.

19. On the other hand, many of these same Midwest companies have recently entered actively into overseas exploration. As foreign production in new concessions is developed, there will be strong incentives to capitalize on overseas investment by bringing that oil into the United States, either by exchanging it advantageously at seaboard for equivalent domestic crude, or by moving the foreign crude or products refined from foreign crude directly into Midwest marketing areas. Here too, so long as U.S. import policy is directed at limitations on total imports, the overseas production of U.S. companies will be actively competing for the limited





access to U.S. markets. And U.S. domestic production is likely to be pressed increasingly upon interior markets as foreign crude moves to both East and West Coasts. Again, Canadian crude is apt to find itself at a disadvantage unless reasons of national security should lead the U.S. to establish explicit preference for Canadian oil as a safe source of supply.

20. On balance, therefore, any substantially expanded market for Canadian crude in the United States in the near future would hinge on the development of U.S. import policy. Over the long run, however, as U.S. requirements move increasingly ahead of U.S. production and the gap that imports must fill grows large, the U.S. market should provide an outlet for substantial quantities of Canadian crude.

21. As compared with expanded export markets in the United States, the movement of Canadian crude eastward to Montreal poses even more acute competitive problems. To reach Montreal, Canadian oil must span a distance as great as that from Venezuela, and at the much higher costs associated with overland transportation. On the basis of current wellhead prices and an assumed extension of the Interprovincial Pipe Line tariff to Montreal at prevailing barrel-mile rates matched against long term tanker rates, Canadian crude would face a disadvantage of some 25 cents per barrel versus Venezuelan crude. (The disadvantage would be larger as against Middle East crudes.) That disadvantage could be overcome by various combinations of (a) a reduction in Canadian field prices; (b) lower pipeline charges; or (c) a change in Dominion policy with respect to an import duty on crude oil.

22. For the Canadian producer, the apparent losses involved in a modest reduction of wellhead prices could be offset in large part, if not in entirety, by the accelerated rate of operations that penetration of the Montreal market would permit. Thus, the current and future capitalized value of reserves need not be adversely affected if, for example, a 10-cent cut in wellhead prices were accompanied by the opportunity for additional production of 200,000 barrels per day. This could be an especially important consideration for smaller producers who are so dependent on a current flow of funds with which to finance exploration and development.

23. With reference to the possibility of reduced pipeline charges, there are several relevant considerations. First, it would appear that somewhat lower barrel-mile rates could be realized over the long haul than those currently in effect. At the time of Interprovincial's original construction, the Canadian oil industry was still at an early stage of development; knowledge about its reserves was limited and forward planning for





market requirements was necessarily constrained. In addition, large diameter pipe was not available at the time of a great deal of its construction. At present, the question is less that of available resources than of potential markets. If forward planning for a substantial eastward movement of Canadian oil were supported by market expectations, then the construction of expanded facilities should be able to benefit from the advantages associated with large-diameter, long-distance pipeline transportation. The Royal Commission's study on Canadian Energy Prospects, for example, indicates that light crude oil could be delivered over modern long-distance pipeline, operating close to capacity, for around 2 to 3 cents per 100 barrel-miles, as against about the current tariff of 3.6 cents per 100 barrel-miles for Edmonton to Sarnia.

24. In addition, there is the possibility of "telescoping" pipeline tariffs so as to minimize costs for the long haul. The Interprovincial rate structure already includes this feature, its barrel-mile charges being higher for closer deliveries than for long distance movements. If it is decided to establish the competitive position of Canadian crude at Montreal, consideration might be given to simultaneous adjustments in wellhead prices and pipeline charges. Minimum rates could be established for shipments to Montreal; intermediate points might have to carry a somewhat larger share of the pipeline's total costs, but refiners along interior locations would not actually have to pay higher delivered prices for their crude, since reduced wellhead prices would more than offset the effect of telescoping the pipeline's rate structure.

25. A Canadian import duty on foreign crude could be still another factor in improving the competitive position of Canadian oil at Montreal. At present, Venezuelan crudes that enter eastern Canada also move in quantity to the U.S. East Coast. There they have to be competitive with the main stream of U.S. crudes from the Gulf. Thus, Venezuelan f.o.b. prices tend to compensate for the U.S. tariff to the extent necessary to make them competitive with U.S. supplies -- and they are available for lifting as Canadian imports at the same f.o.b. prices without having to carry a Canadian duty when they arrive at Montreal. A Canadian duty, therefore, would tend to restore a competitive position for Canadian oil which is indirectly affected by the U.S. tariff.

26. At the present time, Canadian imports of petroleum products are subject to tariffs, averaging around 18 cents per barrel of refinery output at Most-Favored Nation rates. With product imports constituting a substantial portion of eastern Canada's supply stream, product prices tend to reflect those duties. To the extent that eastern product prices have a ceiling set by the cost of imported products, higher crude costs at Montreal --





whether for Canadian or foreign crude, due to a crude oil tariff or other reasons -- are not apt to be passed on to the consumer in the form of higher prices.

27. The discussion thus far has concerned only the narrow problem of achieving competitive equality at Montreal between Canadian and foreign crudes, on the bases of their respective f.o.b. prices. While the disadvantage of Canadian crude of around 25 cents per barrel is large, it could apparently be overcome. A 10-cent reduction in wellhead prices and pipeline charges and a 10-cent duty, for example, would more than offset that disadvantage.

28. But companies that operate refineries at Montreal have other strong commercial reasons for turning to foreign crude supplies. Many of them have access to production of affiliates in Venezuela and the Middle East. Large foreign reserves and low replacement costs combine to provide a powerful incentive toward the continued use of overseas supplies. These commercial considerations of individual companies pose a series of obstacles similar to those faced by Canadian crude in the San Francisco market, with the difference that Montreal operations are "national" to Canada while San Francisco operations are "foreign". To establish Canadian crude at Montreal would therefore not only require the efforts of the Canadian oil industry to achieve competitive equality with foreign crudes. It would probably further require an explicit formulation of public policy in support of Canadian markets for Canadian crude oil.

29. The United States -- whose practice in this regard may or may not recommend itself to Canadians -- has acted to protect its domestic markets for domestic crude oil production by setting individual "quotas" for importing companies and calling upon them voluntarily to comply. Thereby, the U. S. producing industry, whose development is deemed essential to its national security, is supported by voluntary action of the refining industry, even though compliance by individual refiners involves its foregoing of potential commercial advantages in each instance.

30. The cost of oil imports could be an additional consideration in the determination of Canadian policy. In 1956, crude oil imports were valued at \$271,000,000 and were an imposing item in Canada's \$734,000,000 deficit in the balance of merchandise trade. An expanded export market for Canadian crude or the replacement of foreign crudes in eastern Canada would contribute significantly to the nation's foreign trade balance.





X/ 31. In sum, the Montreal market is not an obvious direction of expansion from a logistic point of view and it poses the more difficult problems even in the narrow context of competitive price relationships. If the possibilities of exports to the United States appear to be adequate to the future development of the Canadian oil economy, and the uncertainties attaching to market expansion in the United States are not too discouraging, then Canadian oil may reasonably await a future expansion of its export markets without actively seeking an outlet in eastern Canada.

X/ 32. If, on the other hand, the uncertainties of the U.S. export market appear to inhibit the balanced development of Canadian resources, or the cost of waiting for expanded market opportunities in the United States is too high, then the Canadian producing industry might have to seek relief where its own national policies could prove effective. This would, in fact, mean a penetration of the Montreal market.





# PART I

## RETROSPECT AND PROSPECT

### Recent Trends

X | 1. Crude oil reserves and productive capacity in Western Canada have grown at a striking rate in recent years. Since the beginning of 1951, about 2 1/4 billion barrels of reserves were proved up through new discoveries and through revisions and extensions of existing fields. At the end of last year, reserves were estimated in the neighborhood of 3 billion barrels, as against slightly better than 1 billion barrels only six years earlier. At the same time, productive capacity has been expanded even more rapidly, to about 900,000 barrels per day at the end of 1956. Thus, natural resources have become translated into a major source of national wealth. The financial effort which led to these gains involved expenditures of some \$3 billion for exploration and development alone in the decade since 1946.

X | 2. Large increases have also occurred in crude oil production, as Canadian crude moved progressively into important centers of consumption and refining, not only in Canada but in contiguous areas of the United States. Each penetration of more distant markets involved the construction of major transportation facilities. Canadian crude, because of its interior land-locked location, couldn't trickle into new market outlets; it had to be delivered in large and continuous flows. Since 1954, however, when existing markets were reached, the requirements for Canadian crude have failed to keep pace with productive potential. In consequence, output has been progressively restricted -- and the incentives for continued development threatened. In 1956, crude oil production averaged 470,000 barrels per day, or less than 60 per cent of productive capacity. Reserves at the year's end were equivalent to about 17 years' supply at the prevailing rate of output.

| 3. Total Canadian demand for petroleum products amounted to slightly more than 700,000 barrels daily in 1956, or about 150 per cent of Canadian crude production. Consumption was about evenly divided among Quebec-Maritimes, Ontario, and the Prairies-British Columbia. Refining capacity was slightly below 700,000 barrels daily; refinery operations, at a rate of 93 per cent of capacity, averaged 630,000 barrels daily. Allowing for refinery loss and inventory build-up, it was necessary to import about 100,000 barrels per day of refined products.





X 4. In addition, eastern Canadian refineries imported about 290,000 barrels per day of foreign crudes, chiefly from Venezuela and the Middle East. Thus, total Canadian petroleum imports amounted to almost 400,000 barrels daily. Exports, which were almost entirely of crude oil to the U.S. West Coast and Midwest, came to about 125,000 barrels per day. On balance, Canada showed a sizeable deficit in its foreign oil trade, the while substantial productive capacity was shut in for lack of market outlets.

### Markets, Prices and Transportation

5. In the early stages of development, Canadian crude found its outlets close at hand in the Prairie provinces. Crude oil prices then were determined on the basis of competition with other supplies at Regina. Since Canadian crudes had a locational advantage over the nearest alternative source -- Montana crudes -- Canadian wellhead prices were above those in comparable U.S. fields.

6. With the rapid development of reserves following the discovery of Leduc and Redwater, however, the Prairie markets could no longer provide adequate outlets. A step-up of production, because of the interior location of Canadian reserves, depended on penetration of distant markets in the Great Lakes region. This in turn required the construction of long-distance pipeline facilities, and an adjustment of wellhead prices. When the first Canadian crude reached Sarnia in April 1951, following the completion of the Interprovincial Pipeline to Superior, Canadian wellhead prices were sharply reduced (29 to 44 cents per barrel). The reduction was necessary to meet the competition of U.S. crudes which had been supplying existing Ontario refineries. This reduction pointed up the major factors which influence Canadian wellhead prices: (a) wellhead prices of competitive crudes, (b) transportation costs of Canadian and competitive crudes to price-determining markets, and (c) the exchange rate between Canadian and U.S. currency.

7. The extension of Interprovincial to Sarnia in 1953 and to the Toronto area in 1957 permitted a continuous, year-round flow to refineries in eastern Ontario. As a marginal market for Canadian crude -- where alternative crude supplies can be laid down at the lowest cost -- Sarnia has become the point of price determination for the Canadian crude





price structure.\* Thus, a 25-cent advance in U. S. crude prices in January 1957 was the occasion for an increase in Canadian crude prices, although a simultaneous adjustment in the exchange rate between Canadian and U. S. fields limited the increase in Canadian wellhead prices to 18 cents: i. e. ,

Illinois Crude:

Field price (\$2. 90 + 0. 25)	\$3. 15
Gathering	. 10
Pipeline charges	. 29
Cost at Sarnia (U. S. funds)	<u>3. 54</u>

Cost at Sarnia (Canadian funds: from discount of 1. 6 to 4 per cent)	3. 40
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Redwater Crude:

Pipeline charges	. 68
Gathering	. 05
Field price (\$2. 49 + 0. 18)	<u>\$2. 67</u>

8. Canadian crudes have also found markets in a number of U. S. Midwest areas, where U. S. crudes either have not been available at all or could be obtained only via round-about transportation and at substantially higher costs. Thus two refineries were constructed in the Superior, Wisconsin area following the completion of Interprovincial. In addition, the construction of a transport system comprising the South-Saskatchewan Pipeline in Canada and the Minnesota Pipeline in the United States in 1955 opened up an outlet for medium-gravity Saskatchewan crudes in the St. Paul area. These crudes are priced on the basis of a special formula which relates the laid-down cost to refiners with that of certain Rocky Mountain reference crudes in the Chicago area -- and respond, therefore, to competitive factors involving the eastward flows of U. S. crudes. Thus, a pipeline reduction of 2 cents in the United States, which was not paralleled

\* Although Canadian crude moves further eastward to Toronto, that movement is with, rather than against, the main stream of competitive U. S. crudes, so that no further cost disadvantage is incurred. It is conceivable, of course, that an increased flow of foreign crudes, or of products refined from foreign crudes, could give rise to competitive pressures on Canadian crude prices in eastern Ontario or adversely affect the market potential for Canadian crudes. Completion of the St. Lawrence Seaway might have such an effect, although our own appraisal contemplates increasing preemption of markets in the Toronto area by Canadian crude. (See below.)





by Canadian rates, forced a 2-cent reduction in Saskatchewan wellhead prices in August of this year; an 8-cent price reduction in Rocky Mountain field prices in October forced a comparable reduction in Saskatchewan prices.

9. Meanwhile, Trans Mountain, which began operations in late 1953, enabled Canadian crude to reach Vancouver and, in following years, to supply newly constructed refineries in the Puget Sound area south of the border. These markets had previously been supplied by imports from California -- chiefly in the form of finished products -- resulting in a comparatively high level of product prices. Accordingly, the extension of markets for Canadian crudes to the Pacific Coast did not involve a reduction of wellhead prices, as had the eastward movement into the Lake-head region.

10. With wellhead prices determined on the basis of competitive relationships in relatively distant eastern markets\*, Canadian crudes moving westward thus have a considerable competitive advantage in British Columbia and the Puget Sound area, despite relatively high barrel-mile transportation costs over Trans-Mountain Pipe Line, except when unusually depressed tanker rates operate in favor of, say, Eastern Hemisphere supplies. Any reduction in the Trans Mountain tariff would initially benefit refiners; it would not directly affect Canadian crude prices; so long as prices are determined by competitive considerations at Sarnia, although it might extend the competitive market area for Canadian supplies on the U. S. West Coast.

#### The Limitations of Existing Markets

11. With the penetration of these markets, Canadian crude oil reached the limits of their economic outlets under present competitive relationships. Of the 500,000 barrels daily of crude produced in the third quarter of 1957, about 30 per cent was used in the Prairie provinces themselves, nearly 40 per cent moved east into Ontario (and the U. S. Midwest), and the remaining 30 per cent flowed west into British Columbia and the Puget Sound area of the United States. Canadian markets accounted for about three-quarters and exports to the United States for roughly one-quarter of the total. (See Table 1 for 1956 flow pattern.)

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\* The development of Canadian crude oil pricing, and the questions posed by dual streams moving east and west, are discussed in detail in Appendix C.





TABLE 1  
CANADIAN REQUIREMENTS AND OIL FLOWS FOR 1956

(Thousands of Barrels Daily)

	<u>Canadian Crude</u>	<u>Foreign Crude</u>	<u>Product Imports</u>	<u>Total Crude and product Demand</u>
British Columbia	65	...	16	81
Prairies	153	...	3	156
Ontario	134	25	26	185
Maritimes & Quebec	1	264	54	319
Canadian Crude & Product Supply	<u>353</u>	<u>289</u>	<u>99</u>	<u>741</u>
U. S. Midwest	49			
Puget Sound	53			
Vancouver (Export)	17			
Total Canadian Crude	<u>472</u>			

12. It is noteworthy, however, that Canadian oil has not yet been able to penetrate and hold export markets in areas where it meets competition from the main stream of U. S. or other foreign crudes. In the Puget Sound area, Canadian oil has enjoyed a relatively sheltered market because of its close location and the shortage of local production in California. Wisconsin and Minnesota refiners have not had direct access to the main stream of U. S. crudes, while production in the Williston Basin has thus far been insufficient to justify the construction of pipeline facilities. Michigan refineries utilize only marginal quantities of Canadian crudes and are, moreover, located directly in the path of the Interprovincial Pipeline. The only outlet which is at some distance from the line (Leonard Refineries at Alma, Mich.) has recently ceased to utilize Canadian crude entirely.

13. The difficulties of extending the market for Canadian crude into areas where it must compete with major flows from other sources are vividly illustrated by events surrounding the recent Suez crisis. With tanker transportation extremely short, California refiners were unable to meet their import requirements from normal sources, chiefly the Middle and Far East. The Canadian industry was called upon to fill the gap. Exports from Vancouver reached a rate of 56,000 barrels per day at their





peak; reflecting this demand, total Alberta nominations rose to a record of 437,000 barrels per day in May. But this replacement demand for Canadian crude quickly vanished as tanker tonnage and therefore Eastern Hemisphere supplies again became accessible.

14. With Canadian crude demand limited to requirements within the existing market perimeter the while productive capacity has been progressively built up, Canadian production has been forced to progressively lower rates of operation. (See Table 2 and chart.) In Alberta, where production is prorated in line with market demand, the rate of utilization during the third quarter amounted to only 50 per cent of capacity. This compares with an average of 70 per cent in the United States and of 60 per cent in the U. S. Southwest (PAD District III).

TABLE 2  
CRUDE OIL RESERVES, PRODUCTION AND PRODUCIBILITY  
IN ALBERTA, 1951-1957

	(Millions of Bbls.)		(Thous. BBl. Daily)		Ratio of	Prod'n
	Crude Reserves <sup>a</sup> Jan. 1	Prod'n <sup>a</sup>	Capacity	Prod'n <sup>b</sup>	Reserves to Prod'n	as % of Capacity
3rd Qtr. 1957	...	...	750 <sup>c</sup>	382 <sup>d</sup>	...	50.9
Year						
1957	2,392	...	...	...	...	...
1956	2,170	142	684	393	15.3	57.5
1955	1,928	111	492	309	17.3	62.8
1954	1,624	87	343	240	18.6	70.0
1953	1,526	77	315	210	19.9	66.7
1952	1,328	58	261	161	22.8	61.7
1951	1,165	46	203	126	25.4	62.1

a Includes British Columbia. Source: Canadian Petroleum Association.

b Alberta only. Source: Oil and Gas Conservation Board, Province of Alberta.

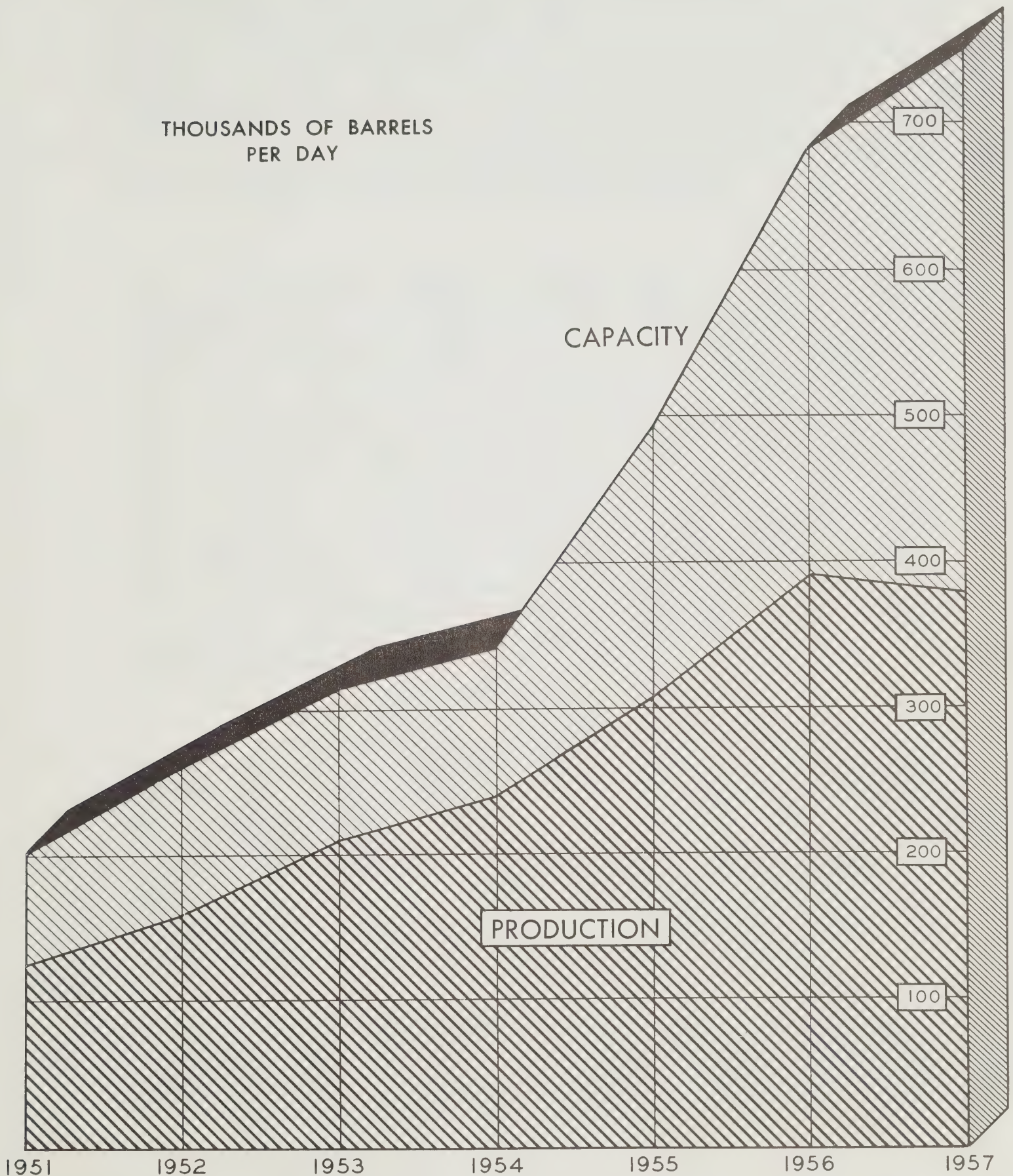
c Estimated.

d Average of actual production in July and August and nominations in September.



# TRENDS IN ALBERTA'S PRODUCTIVE CAPACITY AND RATE OF UTILIZATION, 1951-1957

THOUSANDS OF BARRELS  
PER DAY







15. Recent cutbacks in production have served to point up the effects of market limitations on the Canadian producing industry. With potential supply considerably in excess of requirements, production in Saskatchewan is nonetheless increasing rapidly and preempting markets, as a result of a combination of circumstances ranging from physical conditions of exploration and locational advantage to the economic implications of production that is free of government prorationing. In consequence, Alberta production has had to be severely restricted, raising knotty problems of equity among fields and wells. Although these developments are somewhat beyond the scope of the present study, since they do not affect the total market for Canadian oil, brief reference to these implications may be made because of their importance for the Canadian industry.

16. Production in Saskatchewan has recently increased at a much more rapid rate than in Alberta. In August 1957, for instance, Saskatchewan production rose to a record level of 107,000 barrels daily, as compared with 60,000 barrels daily a year earlier; Alberta production was only 380,000 barrels per day, compared with 437,000 barrels per day a year earlier. Fields in Saskatchewan, particularly in the eastern part, enjoy a considerable locational advantage over Alberta production in eastern markets. As a result, production is able to find ready market outlets and wellhead prices in many instances are above those for comparable Alberta crudes. These factors, in combination, have greatly stimulated exploration and development efforts in Saskatchewan. Moreover, refineries that are part of integrated operations by major companies, can obtain direct access to owned-production, since there is no provincial prorationing to market demand; and the rapid growth of production in Saskatchewan has, of course, encroached upon market outlets available to Alberta producers.

17. A second problem is one of equitable allocation of crude nominations among Alberta producers. On the one hand, some floor allowable that will offer an opportunity for a return on investment is essential if the flow of capital is to be sustained. On the other hand, market opportunities should be allocated among wells of different productive capacity on an equitable basis. Both the "economic allowable" and the method of prorationing have recently been revised. But so long as outlets remain severely limited, relative to the productive potential of the Province, these two problems will continue to plague Alberta producers.

18. In consequence of the low rate of production, particularly in Alberta, the rate of return on invested capital is threatened and the incentives toward further development impaired. This can be especially critical in the case of producing companies with limited access to capital





TABLE 3

WELL COMPLETIONS IN ALBERTA AND SASKATCHEWAN  
1956 AND 1957

	<u>Alberta</u>	<u>Saskatchewan</u>	<u>Total</u>	<u>Per Cent Alberta</u>
<u>1957, 1st Half</u>				
Oil	439	403	842	52.1
Gas	57	3	60	95.0
Dry	194	157	351	55.2
Total	690	563	1,253	55.0
<u>1956, 2nd Half</u>				
Oil	755	574	1,329	56.8
Gas	92	8	100	92.0
Dry	211	231	442	47.7
Total	1,058	813	1,871	56.5
<u>1956, 1st Half</u>				
Oil	613	238	851	72.0
Gas	46	5	51	90.1
Dry	175	103	278	62.9
Total	834	346	1,180	70.6

resources who must rely heavily on a turnover of their invested funds. The impact on incentives has already been reflected in a sharp reduction in Alberta well completions as compared with last year. (See Table 3.)

19. Obviously, the future of the Canadian oil producing industry over the long run will be closely tied to its levels of production. Operations could not long continue at around 50 per cent of capacity without impinging seriously on the flow of investment funds necessary to sustain the vitality of exploration and development efforts. If future market requirements do not support a considerable expansion in production, then continued development at anything like recent rates would mean even further declines in the rate of operations and further build-up of shut-in capacity. Eventually, resource development would have to slacken as economic incentives are impaired.



20. The key to the future thus lies in a balance between the rate of development which might be supported by the physical resources that are apparently available and the economic potential that markets for Canadian crude oil will support.\*

### A Look Ahead

21. The future growth of Canadian crude reserves and productive capacity is subject to a wide range of familiar uncertainties. The Canadian industry is still in an early stage of its development. Prospective areas have only been sparsely explored and every successful wildcat points the way toward multiple development. Meanwhile, reserves added per foot drilled are two to three times those of the United States. Reserve-to-production ratios can probably be sustained for much longer periods on the basis of known reserves and areas potentially available for development.

22. The exploratory effort itself will be greatly affected by a host of considerations -- including continued finding prospects, costs, prices, market outlets, tax policies, etc. -- all of which contribute toward the shaping of "incentives" for oil operations in Canada. Actual results, however, may not correspond closely to efforts exerted over short periods. The discovery of one or a few fields the size of Pembina in quick succession would give a great boost to the industry, while failure to make important finds might have a depressing impact. Over the long run, Canada's physical resources could provide the basis for the rate and extent of development by the oil producing industry.

23. This report will not attempt to make predictions regarding the future trend of Canadian reserves or productive potentials. It will,

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\* In this connection, it is noteworthy that the submission of Imperial Oil Ltd. to the Royal Commission on Canada's Economic Prospects showed Canadian production at 44 per cent of producibility in 1960, adding "that this situation may not correct itself until the 70's." The Imperial report itself notes that "the pace of market expansion might delay development activity to the extent that the estimated producibility of 1,380,000 barrels a day might not be achieved by 1960." While estimates of both producibility and market requirements have undoubtedly been revised since the report was issued in January 1956, the outlook for Canada's oil development must inevitably be determined as much by trends in the industry's economic condition as by the growing knowledge and evaluation of its physical resources.





however, match the predictable market outlook for Canadian crude over the next decade against a range of capacity figures, in order to illustrate some of the implications which alternative market prospects hold for the fortunes of Western Canadian producers. It will also emphasize the importance of market potentials, and thereby of economic incentives, in determining whether or not the development which could be supported by the availability of resources may in fact be achieved.

24. In the sections that follow, we assess the probable demand for Canadian crude over the years ahead in market areas currently being supplied. Projections are not intended as market forecasts; the intention is merely to trace out likely trends, and arrive thereby at the order of magnitude of future market potential, so as to focus on the problems that may have to be faced. On this basis, indicated levels of production are given for 1960 and 1965, and matched against potential production such as could be supported by reasonable rates of resource development. Thus, the economic outlook for Canadian crude is revealed, so far as visibility ahead permits with a tolerable degree of confidence.

#### 1960

25. Looking forward over the coming three years, Canadian crude oil may be expected to fill nearly all of the requirements for crude oil by Canadian refineries as far east as the Toronto area, as well as of U. S. refineries in the State of Washington. In addition, exports to various refineries in the U. S. Middle West can probably be counted upon to increase somewhat.

26. A plausible flow pattern for Canadian oil in 1960 is presented in Table 4. The following assumptions with respect to Canadian oil requirements have been made\*:

Refining capacity in 1960 will include new construction and additions that have been announced for completion by that date. Other construction that has as yet not been definitely scheduled will not be available in time to affect the 1960 picture significantly.

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\* Detailed projections of product demand, refinery operations, and crude and product flows which underlie these figures and those in following sections, are presented in Appendix B.





TABLE 4  
CANADIAN REQUIREMENTS AND OIL FLOWS FOR 1960  
(Thousands of Barrels Daily)

	<u>Canadian Crude</u>	<u>Foreign Crude</u>	<u>Product Imports</u>	<u>Total Crude and Product Demand</u>
British Columbia	89	...	23	112
Prairies	188	...	...	188
Ontario	251	...	19	271 <sup>b</sup>
Quebec	...	282	32	314 <sup>b</sup>
Maritimes & Newfoundland	...	40	43	83
Canadian Crude and Product Supply	<u>528<sup>a</sup></u>	<u>322</u>	<u>117</u>	<u>967</u>
Puget Sound	120			
U. S. Midwest	<u>80</u>			
Total Canadian Crude	728 <sup>a</sup>			

a Includes 33,000 barrels daily of non-crude blending stocks.

b Assuming product shipments of 70,000 barrels daily via Trans-Northern Pipeline from Quebec to Ontario.

Average rates of refinery operations and product yields will not undergo major changes.

Canadian product requirements will be met by Canadian refinery output within the limits set forth above. Thus, the Prairie Provinces will be self-sufficient; Ontario and British Columbia will import only supplemental products.

A significant contribution to Ontario's product requirements will continue to be made by a westward flow of products from Quebec via Trans-Northern Pipeline.

The crude requirements of all Ontario refineries, including expanded capacity in the Toronto area, will be met by Canadian crude.

In sum, the expansion in consumption of petroleum products together with a complete preemption of Ontario's refining requirements should boost Canadian use of Canadian crude from 350,000 barrels per day in 1956 to almost 500,000 barrels per day in 1960.



27. In the United States, outlets for Canadian oil are assumed to expand by the addition of one refinery (Texaco's) in the State of Washington. Requirements of a second plant (Standard Oil of California), construction of which was recently announced but without definite date, are not included. Markets in the Middle West are assumed to increase due to expansion of facilities at Superior and St. Paul; thereafter Canadian crude would share in the normal growth of its present markets, chiefly in Minnesota. Thus, Canadian crude movements to the Puget Sound area are expected to increase from around 50,000 barrels daily in 1956 to 120,000 barrels daily in 1960\*; to the U.S. Midwest, from 50,000 to 80,000 barrels daily; and total exports, from 100,000 barrels daily in 1956 (excluding offshore liftings of about 20,000 barrels per day) to 200,000 barrels daily in 1960.\*\*

28. On the basis of these assumptions, total markets for Canadian crude would amount to around 700,000 barrels per day in 1960, as against approximately 500,000 barrels per day in 1956. The 200,000 barrels-per-day gain over four years implies an average rate of increase of almost 9 per cent per year. It exceeds the anticipated rate of growth in product demand within existing markets (around 7 1/2 per cent per year) because of a combination of circumstances which should operate in favor of Canadian crude production:

An expansion in Canadian refining capacity that will permit a higher degree of product self-sufficiency.

A shift to all-Canadian crude for Ontario's refinery operations.

An expansion in the capacity of refineries that have tended to use Canadian crude in Washington, Minnesota and Wisconsin.

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\* Recent projections of West Coast supply and demand by Standard Oil of California suggest total import requirements of 220,000 barrels daily by 1961, for both California and the Puget Sound area. In view of the historical role of overseas supplies, and the incentives that California refiners may have for their continued import (see Part II below), our estimate for Canadian crude flows to the Puget Sound area would seem to be compatible with the Social balance.

\*\* The competitive position of Canadian crudes in both the Puget Sound area and the U.S. Midwest, which would affect these estimates, is discussed in greater detail in connection with the 1965 outlook. But projections to 1960 might have to be revised downward should the factors considered below become effective over the next few years.





29. This rather substantial increase in the level of Canadian crude oil production by 1960 could be reflected in an improvement in the rate of utilization of productive capacity. Estimates of productive capacity for 1960 range from roughly 1,000,000 barrels per day to almost 1,400,000 barrels per day.\* Any level of capacity around the lower range -- which implies, of course, a significant retardation in the rate of development -- would mean a substantially higher rate of operations than at present. But should recent discoveries in Alberta, which appear unusually promising, be developed on a substantial scale by 1960, so that capacity approximates the upper range of projections, then the rate of operations might well continue at current depressed levels.

X 30. Over the near-term, however, when the results of exploration and development activity may not have an opportunity to reflect the balancing effects of good and bad years, we would not attach too much significance to any one-year's figure on capacity, or the resulting rate of operations. The more meaningful figure is that of probable production. And here the indications are for a tolerably favorable gain. But the forces making for that increase will in large measure be exhausted around 1960. Thereafter, the demand for Canadian crude within existing markets will be largely confined to the annual increases in product demand -- suggesting a progressive retardation in the advance of Canadian production unless new market outlets are reached.

31. It should also be emphasized that basic projections of product demand are predicated on normal economic expansion -- with retardation and acceleration in the rate of growth tending to offset each other over the years. Recent developments, however, emphasize the need for caution against interpreting indicated demand in 1960 as a forecast of actual demand. A leveling-off in the pace of general business activity in 1957 has already adversely affected the expansion in petroleum requirements, and the 1958 outlook is at best uncertain. Thus, the near-term projections to 1960 may not be fully realized, even though anticipated rates of growth may reassert themselves subsequently. An indication of the order of magnitude involved in a temporary retardation in growth can be gotten from the following illustration:

In 1957 Canadian demand for Canadian crude showed virtually no increase over 1956.

If economic developments in 1958 restrain the increase in Canadian demand to only half the normal rate of gain . . .

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\* For historical data and projections of Canadian reserves and productive capacity, see Appendix A.





And the normal trend is reestablished in 1959 and 1960, while export requirements in all years hold up as projected . . .

The indicated demand for Canadian crude in 1960 would be about 75,000 barrels daily below the potential shown in Table 4.

Thus, economic developments may inhibit the rate of increase for Canadian crude production in the short run. Furthermore, U.S. import policy for the West Coast (see Part III) could retard the gains that have been indicated for the Puget Sound area. On balance, there are the favorable circumstances summarized in Paragraph 28, but these effects may well be delayed beyond 1960, in which case the interim problems of the Canadian oil producing industry will be correspondingly more acute.

#### 1965

32. Looking further ahead, we have projected a plausible flow of Canadian crude oil for 1965. The basis of the projections are our own independent estimates of growth in product demand in Canadian markets presently supplied by Canadian crude, coupled with estimates of product demand and requirements for Canadian crude in U.S. markets in which Canadian crude has established an export position.

33. These projections are no longer tied to announced refinery construction plans (as was the case for 1960), but assume that sufficient capacity will be built in the various provinces to meet the demand for clean products. Imbalance between demand patterns and refinery yields might still require modest product imports, however.

34. Accordingly, Canadian crude is expected to supply the total market demand in the Prairie Provinces and British Columbia, except for some imports of heavy products into the Canadian west coast. Similarly, sufficient refining capacity should be developed in Ontario to meet its product requirements, except for the westward movement of products from Quebec via Trans-Northern Pipeline. The announced plans of marketing companies to increase refining capacity (beyond that scheduled for 1960) and the extension of Interprovincial to Toronto will undoubtedly tend to consolidate the position of Canadian crude in eastern Ontario. On the other hand, so long as low-cost foreign crude moves into Montreal, competitive marketing pressures and product pipeline investment are apt to impel a westward flow of products in competition with products refined from Canadian crude. Future years may witness a tapering-off in that



flow, possibly with a sharing of the intermediate market, but while the perimeter of Canadian crude is at Toronto, it is unlikely that the competitive position of its products will be greatly improved at that margin.

35. On the basis of these assumptions, it is expected that requirements for Canadian crude in Canada will increase by about 200,000 barrels daily between 1960 and 1965, to 700,000 barrels per day. (See Table 5.)

36. The 1965 requirements of U.S. markets now being served by Canadian crude pose a range of uncertainties. If the competitive advantage of Canadian crude over alternative crude sources is maintained, Canada's exports should tend to increase, not only by virtue of increased product demand, but also through an increased contribution of Canadian crude in meeting product requirements. At the same time, however, the development of indigenous crude production and transportation facilities, as well as intensified competition from foreign crudes, could adversely affect the competitive advantage which Canadian crude now enjoys.

TABLE 5  
CANADIAN REQUIREMENTS AND OIL FLOWS FOR 1965  
(Thousands of Barrels Daily)

	<u>Canadian Crude</u>	<u>Foreign Crude</u>	<u>Product Imports</u>	<u>Total Crude and Product Demand</u>
British Columbia	128	...	30	158
Prairies	231	...	...	231
Ontario	383	...	...	383
Quebec	...	396	...	396
Maritimes & Newfoundland	...	68	36	104
Canadian Crude and Product Supply	<u>742<sup>a</sup></u>	<u>464</u>	<u>66</u>	<u>1,272</u>
Puget Sound	200			
U. S. Midwest	<u>100</u>			
Total Canadian Crude	1,042 <sup>a</sup>			

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a Includes 43,000 barrels daily of non-crude blending stocks.





## Puget Sound

37. In the Puget Sound area, Canadian crude has established itself in a preferred position. The product requirements of the area had been met by relatively high-cost deliveries from California refineries. When Canadian crude became available at a relatively low cost, refining capacity was developed to realize the economic advantages offered by this new source of supply. By 1956, about 50,000 barrels daily of Canadian crude was moving into the area via Trans Mountain; by 1960, deliveries are expected to reach 120,000 barrels daily.

38. Looking further ahead, product demand in the area (Oregon and Washington west of the Rockies) is expected to advance fairly rapidly, although the availability of natural gas will undoubtedly cut into requirements for some petroleum products. Local refining is due for further expansion, with both Standard Oil of California and Richmond planning new capacity for the years between 1960 and 1965. Should the preference for Canadian crude in the area continue, exports could reach 200,000 barrels daily by 1965. The indicated advances in demand for Canadian crude from 1956 to 1960 and 1965 provide for a progressively increasing ratio of Canadian crude to the area's consumption of petroleum products. In 1956, Canadian crude deliveries represented about 20 per cent of product demand; for 1960, they are estimated at 40 per cent; by 1965, at slightly more than 50 per cent.\* The remaining requirements of the area in 1965 would be accounted for by the refining of other oils (including heavy crudes from Venezuela) and by some continued product deliveries from California.

39. It should be emphasized, however, that the position of Canadian crude in the area is not a guaranteed one. The first commercial production in Washington was recently established, and a follow-up well was successfully completed. As a result, exploratory activity is intense. While the final evaluation of the area's oil-producing potential is uncertain, and development would in any case take time, it is not impossible that substantial

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\* See Appendix B for details. A recent study by the Chase Manhattan Bank sees Canadian exports to Puget Sound at 400,000 barrels daily by 1966. The Chase Manhattan assumptions as to product demand in the area would seem to be about in line with those in our study. However, the greater movement of Canadian crude into the Puget Sound area would be predicated on a more rapid expansion of refinery capacity, up to the area's total product requirements, and the preponderant use of Canadian crude in the area's refineries.





local production might be forthcoming by the 1960's, posing a threat to the demand for Canadian oil. In addition, discoveries in Alaska could lead to a flow of crude oil that would adversely affect Canadian demand. Socal and Richfield -- the two companies who have most recently announced refinery construction for the Puget Sound area -- are jointly engaged in exploration in Alaska with some \$30 million committed for the effort.

40. Furthermore, the pressure of foreign oil on the U. S. West Coast is increasing. Venezuela crude, for example, which has found its East Coast markets limited by import restrictions, could become a more significant source of supply on the West Coast as companies with Venezuelan interests seek outlets for their own production. And newcomers to Venezuela, including West Coast companies, will have to find a "home" for future production, even if it involves price concessions. Similarly, Eastern Hemisphere supplies might well become a factor at Puget Sound. At present price relationships, Canadian crude is competitive in terms of laid-down cost, even with low tanker rates (and considering Trans Mountain's reduced tariff which is scheduled to go into effect in 1958). But with both Middle East and Indonesian production scheduled for rapid increases, markets will be an ever-pressing concern. Thus, the opportunity that an integrated company has for the use of its own crude may be a more important commercial consideration than pro forma cost comparisons.\*

41. The attractiveness of Canadian oil for refiners in the U. S. Northwest would be enhanced by any reduction in the Trans Mountain tariff as throughput increases. The company's original prospectus, for example, showed an illustrative rate of 40 cents at a volume of 75,000 barrels daily, decreasing to 25 cents at 200,000 barrels daily. Even though such a reduction would not be reflected in wellhead prices -- Canadian crudes would have to remain competitive for shipments to eastern markets -- it could extend the range of marketing for products refined from Canadian crude southward and accelerate refinery construction in the area.\*\*

42. In sum, it would appear that the size of the Puget Sound market for Canadian crude is highly uncertain. The expected growth in product consumption -- coupled with the availability of Canadian crude and the

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\* These factors are discussed further in Part II, in connection with the prospects for Canadian crude in California markets.

\*\* It is noteworthy that Carter Oil Co., a subsidiary of S. O. (N. J.) has entered marketing in Washington and plans further expansion in that state and in Oregon.



competitive position it could claim, especially if pipeline rates were reduced -- certainly favors an increasing flow of Canadian oil during the Sixties. The unknowns involve the role of local and Alaskan crudes in the area; U. S. import policy; and the possible commercial incentives of integrated companies marketing in the area to ship products north from California refineries (which would retard refinery expansion in the Northwest) or to import overseas crude in addition to Canadian crude as refinery capacity is enlarged. Our estimate of 200,000 barrels per day represents a balance of these opposing considerations; but the range of uncertainties is in fact the only certain feature of the 1965 outlook.

#### Minnesota-Wisconsin

43. Canadian oil currently has a clear locational advantage over alternative crude oil supplies in the Superior, Wisconsin and Minneapolis-St. Paul areas. This advantage derives in part from purely geographical circumstances (for Saskatchewan crudes), plus the fact that Canadian crudes have direct access to the area while U. S. crudes from the Southwest or the Rocky Mountains would have to be moved up by barge from Wood River, Illinois at a considerable extra cost.

44. Refining capacity in the St. Paul area was developed to capitalize on the competitive opportunities offered by the availability of Canadian supplies. Medium gravity Saskatchewan crudes marketed in the St. Paul area are priced so as to relate the laid-down cost to the refiner to that of certain Rocky Mountain crudes to refiners in the Chicago area. In this way, the competitive advantage of Canadian crude to the refiner is protected. Thus, Fosterton and other crudes were reduced by 2 cents per barrel in August 1957 to compensate for a reduction in pipeline tariffs to Chicago refineries; Saskatchewan wellhead prices were reduced again by 8 cents in October to match a similar reduction in wellhead prices of Rocky Mountain crudes.

45. An extension of markets for Canadian crude in this area faces two major difficulties. First, it would require pushing back the flow of refined products which constitute a major portion of the area's total supply. Products can be shipped east from Mandan, North Dakota, north from Oklahoma (via Great Lakes Pipeline), and west from Chicago (via Standard of Indiana Pipeline). The Twin Cities area which constitutes the backyard of refineries operating on Canadian crude is traditionally the scene of intense price competition. A southward extension of the product watershed for Canadian crudes would certainly encounter the most intense





resistance from both Midwest and Mid-Continent refineries. However, the possibility remains that new refinery construction may be projected for Minnesota in order to take advantage of Canadian crude availability.

46. A further uncertainty stems from the development of crude resources in the U. S. portion of the Williston basin. This has now progressed to a point where the construction of a pipeline from eastern Montana and North Dakota into the Twin Cities region is being considered. Such a line would give U. S. crudes direct access to that area and would thus eliminate the special transport advantage which Canadian oil enjoys there. Thus, further expansion of refining capacity does not inevitably mean increased utilization of Canadian crudes.

47. Considering all these factors, the 1965 demand for Canadian crude in this area could reach 100,000 barrels per day. A large volume of exports would probably hinge on future competitive relationships and U. S. import policy such as are involved in the broader prospects for Canadian oil in the U. S. Midwest and which are discussed in detail in Part II.

### Prospects vs. Potentials

48. The prospects for Canadian crude oil production thus indicate a volume of around 1,000,000 barrels per day by 1965 to serve markets that fall within the present perimeter of Canadian crude movements. This includes 700,000 barrels daily for Canadian requirements, 200,000 barrels daily for the Puget Sound area and 100,000 barrels daily for Minnesota-Wisconsin. The indicated increase of 300,000 barrels daily over 1960 demand represents an advance of about 7.5 per cent per year, a rate somewhat in excess of the anticipated growth in product requirements and explained by the further penetration of Canadian crude relative to consumption in U. S. export markets.

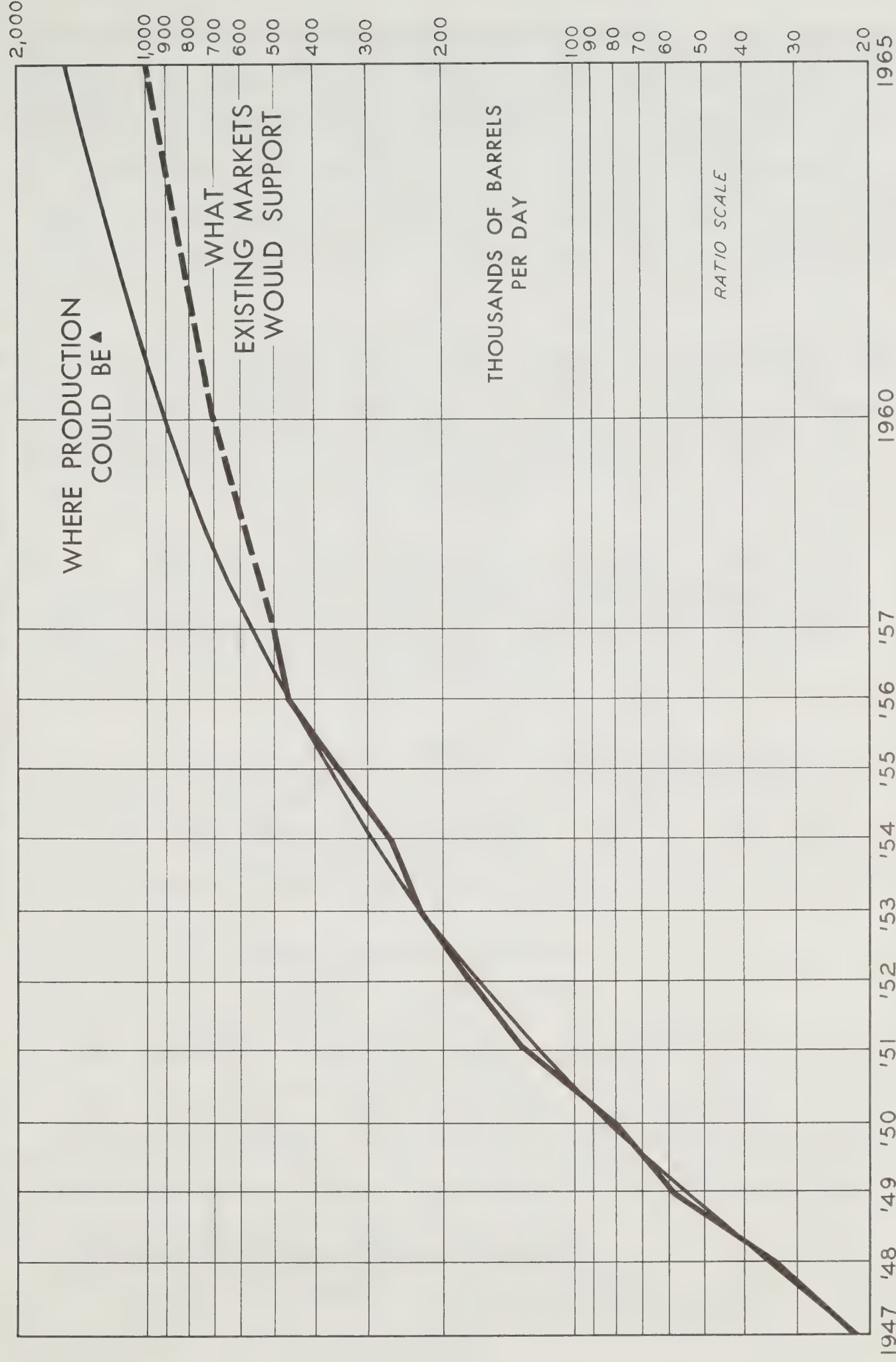
49. The outlook for 1960 and 1965 is matched against Canada's production potential in the following chart. Potential production is set out as a trend that emerges from historical experience as to rates of growth in production and then moves along a path that is believed to be consistent





# CANADIAN CRUDE OIL PRODUCTION, 1947-1965

## RETROSPECT AND PROSPECT



▲ BASED ON 1947-1956 TREND IN PRODUCTION TOGETHER WITH ESTIMATES OF RESOURCE AVAILABILITY IN THE FUTURE.



with the physical availability of Canadian oil resources.\* Thus, the trend line, which traces out potential production, reflects the declining rate of growth in past years and implies a progressive tapering-off in the future. It points to an ultimate limit to production of 3 million barrels daily. For 1980, the trend would indicate a production potential of around 2.75 million barrels daily (and remaining reserves of, say, 13 billion barrels at a 13-year ratio of reserves to production) -- figures which are, incidentally, within the range of estimates submitted by Imperial Oil Ltd. to the Royal Commission on Canada's Economic Prospects and the Royal Commission's own estimates for 1980.\*\*

50. The course of production will, of course, never follow a smooth path, such as is indicated by a trend of potential production. In 1951, actual production was somewhat above the trend as Canadian crude moved eastward to Sarnia; in 1954, actual production fell below the trend, as demand lagged due to recession; in 1956, production again exceeded the trend, under the stimulus of the Suez crisis.

51. Beginning with the disappointing performance of 1957 and extending into the future, the levels of production which can apparently be supported by demand for Canadian crude in existing markets fall progressively short of production potentials. By 1960, the gap amounts to 200,000 barrels per day; by 1965, to 500,000 barrels per day.

52. There is, of course, nothing sacrosanct about a projected trend in production potential. Even though it may be consistent with what physical resources could support, the rate at which those resources are discovered and developed, first into productive capacity, then as actual production, will depend on economic incentives. To the extent that prospects for Canadian crude in existing markets fall short of potential

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\* The trend is defined by a difference equation:

$$\log X_t = .9 \log X_{t-1} + 0.351,$$

where  $X_t$  = production in any given year. This equation was fitted to actual production for 1947-56, but was selected from among a variety of alternative functions which might have resulted in a "good fit" because its projection into the future yielded values which are consistent with informed industry estimates as to Canada's resource potentials.

\*\* The estimates for 1980 of Imperial range from 2 to 3 million barrels daily for production; 2.8 to 3.8 million barrels daily for producibility; and 13.3 to 17.4 billion barrels for year-end reserves. c.f., Prospects for Canada's Oil Industry, 1955-1980, p. 17. The Royal Commission has selected 3 million barrels daily as representative of likely production by around 1980. c.f., Canadian Energy Prospects, p. 139.





production, the opportunity for a more favorable performance would depend on the possibility of extending the marketing area. But any advance in the market frontier for Canadian crude in the future, as in the past, will involve certain costs in order that Canadian crude establish a competitive position in still more distant markets.

53. An extension of markets beyond the present competitive perimeter (delineated by Puget Sound, Twin Cities and eastern Ontario) involves a substantial step. Such an extension would necessitate reaching out into the next large refining complex: i. e., San Francisco in the west; the Chicago area (through a movement south from Superior or east from St. Paul) or the Detroit-Toledo area (southward from Sarnia) in the Midwest; or an eastward push into the Montreal market. Or it could involve a major expansion of refining capacity along the perimeter itself, operating on Canadian crude with products moving beyond their present watershed. In each case, it would involve intense competition with the main stream of U.S. crudes or of low-cost foreign crudes. If such a competitive position could be established, the return would be measured by increased production and a new fillip to the rate of development for the Canadian producing industry. But the prospective returns in each case would have to be weighed against the costs involved.





## PART II

### ALTERNATIVES FOR THE FUTURE

1. In preceding sections we reviewed the Canadian oil producing industry in retrospect and in prospect. Looking backward, we found that an unusually rapid growth in reserves, productive capacity and production was associated with a penetration of Canadian crude oil into progressively more distant refining centers. Thus, a marked expansion in market outlets supported an expansion in production, which in turn provided the economic incentives for the development of reserves and producibility.

2. Looking ahead, and taking a long view, it would appear that the country's physical resources could support a further expansion in the Canadian oil producing industry of striking proportions. While long range projections for a relatively young industry always involve heroic assumptions, the judgments of Imperial Oil Ltd., as submitted to the Royal Commission on Canada's Economic Prospects, do not seem unreasonable. By 1980, reserves are expected to range between 13.3 and 17.4 billion barrels, with productive capacity of 2.8 to 3.8 million barrels per day. But if the natural resources which could provide such an economic potential are to be discovered and developed, the incentives for investment by the oil producing industry must derive from a rising trend of production and income that is consistent with the implied rate of expansion in reserves and productive capacity.

3. At present, the Canadian producing industry is operating at so low a rate of capacity as to affect adversely the returns on existing investment, and raise serious questions about incentives during the near future. Our review of prospects for the years through the mid-Sixties indicates that the problem is apt to be a continuing one. Within the market perimeter now being served by Canadian crude, requirements for Canadian oil will be largely limited to normal growth in the consumption of petroleum products. At the perimeter itself, where the competitive position of Canadian crude with alternative crude supplies is a crucial consideration, opposing forces are at work. On the one hand, the existing competitive cost advantage of Canadian crude should make for increasing utilization by refineries serving markets in the U. S. Northwest and Midwest and eastern Ontario. On the other hand, the development of competitive crude oil sources, and transportation facilities for both crude oil supplies and products refined from non-Canadian crude, could impinge on the market demand for Canadian oil.



4. On balance, we would expect that Canadian crude production over the next 8 to 10 years will benefit from an expansion of demand in refining centers at the present market perimeter. The extent to which this will be so is uncertain, however, and will depend on competitive relationships, the commercial considerations of individual companies, as well as U. S. import policy.

5. More significant is the fact that future prospects for Canadian production, even if supported by favorable developments within the present market area, fall below the trend that could be supported by the apparently available resources. It is, of course, true that as the flow of Canadian crude reaches its competitive frontier, the rate of expansion of the producing industry must inevitably be retarded. In the development of a new industry, the most accessible markets are captured first; further expansion involves increasingly more difficult competition, often requiring price reductions. Every extension of the marketing frontier involves a balance between the costs of establishing a competitive position and the benefits of increased production.

6. In the following sections, we consider alternative directions in which the flow of Canadian crude might expand. Various export possibilities to the U. S. are reviewed in turn, as well as an extension eastward within Canada. Initially, alternative market prospects are considered solely from the standpoint of transport logistics, in order to determine the natural economic outlets for Canadian oil. That is, given the supply streams of various crudes available to the United States and Canada, how might they be rationally allocated so as to minimize transportation costs all around. From this logistic pattern, we get a first indication of how alternative markets would rank as potential outlets for Canadian crude.

7. Subsequently, additional considerations which would affect the position of Canadian crude are introduced to complete a realistic evaluation of market potentials. Among these will be the commercial policies of individual companies with respect to their crude oil requirements and a range of governmental policies on both sides of the border.

8. What emerges from the detailed analyses that follow is not only an evaluation of market potentials, but also an estimate of the costs that would have to be incurred in extending the market perimeter for Canadian crude. Whether the existing competitive frontier should be penetrated -- and when -- are decisions that rest on a balance of costs versus returns that involves not only the interests of the Canadian producing industry,





but those of the Canadian oil industry as a whole, and an even broader national interest. That balance can, of course, only be struck in Canada by Canadians.

### Transport Logistics

9. A plausible supply-demand balance for the United States and Canada in the mid-1960's is shown in Table 6. The outstanding feature that emerges -- and recurs in other projections even where detailed figures may differ slightly -- is the very large deficit position of the United States, amounting to 2.5 million barrels per day East of the Rockies and 1.0 million barrels per day on the Pacific Coast.

10. Canadian supplies and requirements are projected at 1.3 million barrels daily; a deficit of 500,000 barrels daily in the eastern provinces is balanced by an equal surplus in the west. The estimate of requirements is presented as a tolerably reasonable figure, given the usual range of

TABLE 6

#### POSSIBLE OIL SUPPLY POSITION OF NORTH AMERICA, MID-1960's

(Millions of Barrels Daily)

	<u>Requirements</u>	<u>Supplies</u>	<u>Surplus (+) or Deficit (-)</u>
U.S. West Coast	2.0	1.0	-1.0
U.S. East of Rockies	12.5	10.0	-2.5
Quebec and Maritimes	0.5	...	-0.5
Other Canada	<u>0.8</u>	<u>1.3</u>	<u>+0.5</u>
TOTAL	15.8	12.3	-3.5
<u>Deficit Supplied From</u>			
Venezuela			2.5
Eastern Hemisphere			1.0



uncertainty in such projections. The production figure, however, is accepted only as a point of departure for the logistic analysis. As was pointed out in preceding sections:

Our own estimates suggest that existing markets would absorb only about 1.0 million barrels per day of Canadian crude by 1965.

At that level of production, output would fall considerably below the trend that is implied by projections based on Canada's physical resources and potentialities. Thus, further development of reserves and productive capacity even at retarded rates would mean continued under-utilization; or alternatively, the lag in market demand and production could inhibit exploration and development by undermining incentives for investment.

An added market for 200,000 barrels daily (as is implied in the preceding and following tables) is accepted merely to illustrate the problems of expansion into alternative market areas.

11. The net deficit for North America of 3.5 million barrels per day is presumed to be filled by surplus production of 2.5 million barrels daily drawn from other Western Hemisphere countries, together with imports of 1.0 million barrels daily from the Eastern Hemisphere. On this basis, and if North American requirements were to be met by crude oil supplies as outlined above, the most natural outlet for Canadian crude would be in California, as compared with alternative movements either to the U.S. Midwest or to Eastern Canada. (This, of course, is true a fortiori with respect to the Puget Sound area.)

12. The combined transport cost of moving Alberta crude to San Francisco and Venezuelan crude to Montreal is only 60 per cent of the cost of moving Canadian crude to Montreal and Venezuelan crude to California; similarly, it is substantially less than the combined cost of moving Canadian crude to Montreal, additional Venezuelan crude to the U.S. East Coast, and displacing Middle East crude to the U.S. West Coast. Also, the combined costs of transporting Canadian crude to California, U.S. crudes to the Middle West and Venezuelan crudes to the East Coast are substantially below those of moving Canadian crudes to the Midwest and U.S. and Venezuelan crudes to the Coastal areas. (See Table 8.)





TABLE 7

## POSSIBLE OIL BALANCE OF NORTH AMERICA, MID-1960's

(Millions of Barrels Daily)

Source of Supply	Requirements				Total Supplies
	United States		Canada		
	East-of-Rockies	West Coast	East	Other	
United States:					
East-of-Rockies	10.0	...	...	...	10.0
West Coast	...	1.0	...	...	1.0
Canada	<u>0.1</u>	<u>0.4</u>	<u>...</u>	<u>0.8</u>	<u>1.3</u>
North America	10.1	1.4	...	0.8	12.3
Other Western Hem.	2.0	...	0.5	...	2.5
Eastern Hemisphere	<u>0.4</u>	<u>0.6</u>	<u>...</u>	<u>...</u>	<u>1.0</u>
Total Requirements	12.5	2.0	0.5	0.8	15.8

13. It should be repeated at this point that the preceding flow patterns assume that existing crude price relationships would be maintained and that the quantities of crudes making up the several streams from each source would be as indicated. For example, U.S. West Coast requirements over and above domestic consumption of 1.0 million barrels daily are assumed to be met by 400,000 barrels daily of imports from Canada and 600,000 barrels daily from the Eastern Hemisphere. But if the future supply stream from the Eastern Hemisphere were to be greater than that assumed, then the shares of Eastern Hemisphere and Canadian crudes in filling the West Coast deficit would depend on more than logistic considerations.

14. Against this background of transport logistics, it is now possible to discuss the prospects that Canadian oil will in fact be able to establish itself in California, or alternative markets. The role of commercial policy among individual companies and political considerations will have to be introduced in order to evaluate actual prospects in the most realistic terms. In the discussion that follows, the California market is considered first, followed by the U.S. Midwest and then Montreal.



TABLE 8

TRANSPORTATION COSTS FOR ALTERNATIVE SUPPLY PATTERNS  
FOR NORTH AMERICA

(Dollars Per Barrel)

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<u>Case (A)</u>	Edmonton to San Francisco	.39
	Puerto la Cruz to Montreal	<u>.39</u>
		<u>.78</u>
	<u>versus</u>	
	Edmonton to Montreal	.68
	Puerto la Cruz to San Francisco	<u>.62</u>
		<u>1.30</u>
 <u>Case (B)</u>	Edmonton to San Francisco	.39
	W. Texas to Chicago	.35
	Puerto la Cruz to U. S. East Coast	<u>.28</u>
		<u>1.02</u>
	<u>versus</u>	
	Edmonton to Chicago	.48
	W. Texas to San Francisco	.52
	Puerto la Cruz to U. S. East Coast	<u>.28</u>
		<u>1.28</u>
	<u>or</u>	
	Edmonton to Chicago	.48
	W. Texas to U. S. East Coast	.55
	Puerto la Cruz to San Francisco	<u>.62</u>
		<u>1.65</u>

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Assumptions:

Canadian pipelines: 3 cents per 100 barrel-miles.

U.S. pipelines: actual tariffs (W. Texas-California: proposed).

U.S. coastwise tankers: USMC flat.

Other tankers: USMC-30 per cent.





## The California Market

15. The comparison of transportation costs has already indicated that California is a logical market outlet for Alberta crude. In Part I, we had considered at length the prospects for Canadian crude in the Puget Sound area. To the extent that Puget Sound refining capacity may not be expanded sufficiently to provide adequate outlets for Canadian crude, or alternative supplies are available to fill at least a part of the area's crude requirements, Canadian crude may have to look further south. The San Francisco area, with the next refining complex south of Puget Sound, has a present throughput capacity of some 400,000 barrels daily. Local crude production in California has been static for several years while demand has been increasing rapidly. Thus, California has to import more than 200,000 barrels daily of foreign crude at the present time; by 1965, the deficit may amount to as much as 800,000 barrels per day.

16. On the basis of present wellhead prices, current tariffs of Trans Mountain Pipeline and tanker rates of USMC-30 per cent, the delivered price of Canadian crude at San Francisco would compare favorably with that of Eastern Hemisphere and Venezuelan crudes. However, an appropriate tanker rate at which Eastern Hemisphere crude might move, in a regular flow and considerable volume, would probably be considerably lower. A California refiner, with access to low-cost Middle East crude, for example, would certainly plan to maximize that advantage by covering the bulk of his tonnage requirements at the favorable rates obtainable under long-term fixtures. (A Sun Oil Co. /World Tankers Corp. 6-year contract covering Middle East-to-U.S. East Coast crude movements provided tonnage at around USMC-50 per cent.) Considering then a tanker rate of USMC-45 per cent, Canadian crude could be laid down at a lower cost than Venezuelan crude, but would be at a competitive disadvantage as against Middle East crudes.\* (See Table 9.)

17. A critical factor in the competitive position of Canadian crudes moving westward is, of course, the tariff of Trans Mountain Pipeline. On a barrel-mile basis, Trans Mountain rates have been substantially higher than other crude oil pipeline tariffs either in Canada or the United

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\* No account is taken here, or in subsequent cost comparisons, of the quality differential between Canadian and competitive crudes. In the case of Saudi Arabian crude, Redwater crude has been estimated to carry a premium of some 16 cents per barrel, but this valuation would undoubtedly vary among refiners, depending on technical facilities and desired yield patterns.



TABLE 9

COMPARISON OF LAID-DOWN CRUDE OIL PRICES  
AT SAN FRANCISCO\*

	<u>Actual</u>	<u>Reduced Pipeline Tariff<sup>a</sup></u>
<u>Canadian</u>		
Wellhead Price (Redwater 35°)	2.630	2.630
Pipeline Charges to Edmonton	<u>.073</u>	<u>.073</u>
	2.703	2.703
Pipeline Charges to Vancouver	.427	.277
Marine Loading Charge	<u>.025</u>	<u>.025</u>
Canadian \$	3.155	3.005
U.S. \$ <sup>b</sup>	3.313	3.155
Freight to San Francisco	.148	.148
U.S. Duty	<u>.105</u>	<u>.105</u>
TOTAL	<u>3.566</u>	<u>3.408</u>
	<u>At USMC-30%</u>	<u>At USMC-45%</u>
<u>Venezuelan</u>		
F.O.B. Puerto la Cruz (Oficina 35°)	3.050	3.050
Freight to San Francisco	.627	.493
Insurance and Loss	.005	.005
U.S. Duty	<u>.105</u>	<u>.105</u>
TOTAL	<u>3.824<sup>c</sup></u>	<u>3.688<sup>c</sup></u>
<u>Middle East</u>		
F.O.B. Ras Tanura (Arabian 35°)	2.100	2.100
Freight to San Francisco	1.514	1.190
Insurance and Loss	.005	.005
U.S. Duty	<u>.105</u>	<u>.105</u>
TOTAL	<u>3.760<sup>c</sup></u>	<u>3.430<sup>c</sup></u>

a Rate shown in Prospectus for throughput of 200,000 barrels daily.

b \$1.05 U.S. per \$1.00 Canadian.

c No account is taken of quality differentials compared with Canadian crudes.

\* Kettleman Hills crude lays down at \$3.69 to \$3.72 for a freight range of USMC-25 to USMC flat.





States. However, construction problems were obviously greater than for other lines, and the build-up of throughput was delayed by the failure of off-shore shipments to materialize as anticipated. By the end of 1956, throughput reached 185,000 barrels daily. And while current deliveries, at less than 100,000 barrels daily, are adversely affected by reduced nominations from refineries both in British Columbia and the U.S. Northwest, the pipeline has announced a 5-cent reduction in its rates beginning in 1958. (It is this lower rate which is used in the cost comparison in this study.)

18. If Trans Mountain rates were further reduced, i.e., as originally envisaged for higher levels of throughput,\* Canadian crudes could be competitive with Middle East oil even at tanker rates of USMC-45 per cent. The fact that San Francisco refiners have direct access (or the opportunity of purchases at favorable long-term contracts) to Eastern Hemisphere crudes means, of course, that the competitive position of Canadian crudes will in fact involve more than pro forma cost equality.

19. Ignoring the latter point for the moment, an extension of Canadian crude to the San Francisco area would bring substantial benefits to the Canadian producing industry; and would also appear to have considerable merits for California refiners. Canadian producers would obtain access to a large and rapidly growing market in which their production might be competitive at current wellhead prices. In addition, the very considerations that apply in San Francisco would at the same time tend to consolidate the competitive position of Canadian crudes in the Pacific Northwest and increase incentives toward refinery expansion and a preemption of products requirements in that area. San Francisco refiners, all of whom are already participating to a greater or smaller extent in Canadian crude oil operations,\*\* would obtain an assured supply from a near-by, secure source.

20. But the logistic reasons which favor the use of Canadian crude in California in the future presumably have equal merit today. Nevertheless, California refiners have drawn on Canadian supplies only during

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\* The original prospectus gave an illustrative tariff of 25 cents per barrel at a throughput of 200,000 barrels daily. Should Canadian crude move to California, this demand added to Puget Sound and Vancouver requirements would obviously permit operations at pipeline capacity.

\*\* Companies with large refineries in the San Francisco area are Shell, Standard Oil of California, Tidewater and Union.



emergency periods and are actually importing very large quantities from more distant sources, particularly the Eastern Hemisphere. It is thus obvious that a number of obstacles would have to be overcome before Canadian crude oil could establish itself firmly in the California market.

21. A principal difficulty is the fact that San Francisco refineries are operated by integrated companies all of which have direct access to vast reserves in the Eastern Hemisphere. Three of the four also have a strong position in Venezuela. Given a choice among foreign crude sources, these companies will probably continue to prefer Indonesian and Persian Gulf crudes. Reserves are established and replacement costs low. Owned-production, or even long-term purchases, mean greater over-all profits than on Canadian supplies which would involve substantial crude purchases for every barrel of owned-oil.\*

22. A final consideration bearing on the prospects for Canadian crude in the San Francisco refining area -- and the one which could on balance be a determining factor -- is U. S. import policy.\*\* So long as there are no limitations on either the volume or origin of crude oil imports into the West Coast, Canadian crude is not likely to establish itself south of Puget Sound, even under favorable cost conditions, for the reasons set forth above. The import policy laid down in mid-1957 by the U. S. cabinet committee states that:

Pending a change in the deficit condition now pending in the area by, for example, the development of an economical means of interregional transportation, the level of imports must be such as to make up the difference between the demand and the quantity of domestic crude oil available to the area. . . .

For the second half of 1957, that quantity of supplemental crude was determined to be 275,000 barrels per day. With a West Coast pipeline scheduled to move Four Corners crude to the Los Angeles area by early

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\* Under the Alberta practice of prorating production to market demand, an individual producer is not in a position to expand his market outlets by offering an attractive long term supply arrangement to a refiner who might be induced to switch to Canadian crude. In this respect, Canadian producers are unable to match the potential offerings that may stem from other major producing areas where large production potential is in the hands of individual companies, and not only free of prorationing but actually being pressed to maximum rates of output by foreign governments that have granted concessions.

\*\* A comprehensive review of U. S. import policy, and its significance to Canada's export potential, appears in Part III.





1958 and continuous pressures to link Southwest surplus production with the West Coast deficit area, import restrictions are apt to be a recurring issue. Thus, Canadian crudes may be confronted with ample supplies of Eastern Hemisphere crude available to California refiners, within an overall limitation on the level of imports.

23. Should the deficit position of the West Coast increase in future years, as is anticipated, import requirements will mount. But there is no assurance that Canadian supplies will then be regarded as any more attractive among alternative foreign crudes than now. Furthermore, East Coast import limitations have already displaced Venezuelan crudes\*, which then must seek alternative outlets. As Venezuelan production builds up, especially in new concessions held by "newcomer" companies, the pressure for outlets could increasingly involve West Coast refineries, either because they are owned by integrated companies operating in Venezuela or because price concessions are held out to independent refiners as a means of finding a "home" for new production.

24. On the other hand, the raison d'etre of U. S. import policy is the national security -- to maintain incentives for domestic exploration and development, and to maximize the flow of supplies from safe sources. Thus, import policy under ODM directives in 1956 exempted Canadian and Venezuelan oils from voluntary limitations. While this preferential treatment of Western Hemisphere crudes was not mentioned in the 1957 report of the cabinet committee, the principle may well be reasserted in the future, when the level of imports becomes increasingly less controversial (because of mounting deficits), but the vulnerability of imports becomes a more important concern. Canadian crudes, therefore, may find an established market in California, if U. S. import policy moves in the direction of preferential treatment for Canadian (and Venezuelan) supplies. But the commercial roadblocks against the penetration of Canadian crudes into California are apt to be removed only by the most decisive expression of such a U. S. policy.

#### U. S. Middle West

25. The construction of the Interprovincial Pipeline running over an extensive portion of U. S. territory has enabled Canadian crude to reach a

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\* As a result of voluntary adjustments to East Coast "quotas", Venezuelan shipments in the second half of 1957 were reduced more than 100,000 barrels daily below original company schedules.



number of existing and new refineries in the U. S. Middle West. It is supplying all of the requirements of two plants in the Superior, Wisconsin area and the marginal needs of several Michigan refineries along the pipeline route to Sarnia. In addition, a market has been developed in the St. Paul area for medium-gravity Saskatchewan crude, with the construction of special transport and refining facilities to handle this oil.

26. It should be emphasized that the present outlets for Canadian oil in the Midwest consist of refineries which either have not had access to U. S. crudes at all or which could obtain it only by expensive, round-about transportation. In several instances, in fact, the sheer availability of Canadian crude was the reason for construction of new refining facilities. The next step in extending Canadian crude oil markets will require a crossing of the watershed (as already defined) into refining areas which have access to well-developed sources of supply.

27. An extension of the market for Canadian crude could take place to one or more of the following areas of the U. S. Middle West: (a) an expansion of outlets in Minnesota, in competition with products currently being shipped into the state; (b) a branch from either the Superior terminal of Interprovincial or the St. Paul terminal of Minnesota Pipeline into the Chicago area; (c) a southward flow from Sarnia into the Detroit-Toledo region (reversing the present flow of U. S. crude into Canada); (d) connecting the newly completed segment of Interprovincial near Toronto with refineries in the Buffalo area.

28. The prospects for Canadian crude in the Minnesota-Wisconsin area have already been discussed in Part I. It need only be added here that whatever steps might be taken to establish Canadian crude in the Great Lakes area would at the same time serve to improve the balance in favor of Canada's competitive position in the Minneapolis-St. Paul area.

29. In the central Great Lakes region (comprising the Chicago, Detroit and Toledo refining districts) Canadian crude is at a substantial basic transport disadvantage. All major refineries in this region enjoy access to a variety of crude oil sources in the West and Southwest by means of large-diameter, low-cost pipelines. In most instances refiners participate in the ownership of these lines. Most of them also have available substantial domestic crude oil sources of their own, although in the Southwest and Mid-Continent, all producing wells share in the total market outlet on a pro rata basis.





TABLE 10

## COMPARISON OF LAID-DOWN CRUDE OIL PRICES AT DETROIT

	<u>At Actual Tariff</u>	<u>At Reduced Tariff<sup>a</sup></u>
<u>Canadian</u>		
Wellhead Price (Redwater 35°)	2.630	2.630
Pipeline Charges to Edmonton	<u>.073</u>	<u>.073</u>
	2.703	2.703
Pipeline Charge to Detroit	.655 <sup>b</sup>	.544
Pipeline Allowance	<u>.017</u>	<u>.016</u>
Total ex. Duty		
Canadian \$	3.375	3.263
U. S. \$ <sup>c</sup>	3.544	3.426
U. S. Duty	<u>.105</u>	<u>.105</u>
TOTAL	<u>3.649</u>	<u>3.531</u>
<u>West Texas Sweet</u>		
Wellhead Price (35°)	3.050	
Gathering	.050	
Pipeline Tariff	.470	
Pipeline Allowance	<u>.018</u>	
TOTAL	<u>3.588</u>	
<u>Illinois</u>		
Wellhead Price	3.150	
Gathering	.100	
Pipeline Charges	.200	
Pipeline Allowance	<u>.034</u>	
TOTAL	<u>3.484</u>	

a At 3 cents per 100 barrel-miles.

b Including Sarnia-Detroit at 3.7 cents per 100 barrel-miles.

c At \$1.05 U. S. per \$1.00 Canadian.



TABLE 11

## COMPARISON OF LAID-DOWN CRUDE OIL PRICES AT CHICAGO

	<u>At Actual Tariff</u>	<u>At Reduced Tariff<sup>a</sup></u>
<u>Canadian</u>		
Wellhead Price (Redwater 35°)	2.630	2.630
Pipeline Charges to Edmonton	<u>.073</u>	<u>.073</u>
	2.703	2.703
Pipeline Charge to Chicago	.586 <sup>b</sup>	.450
Pipeline Allowance	<u>.016</u>	<u>.016</u>
Total ex. Duty		
Canadian \$	3.305	3.169
U. S. \$ <sup>c</sup>	3.473	3.327
U. S. Duty	<u>.105</u>	<u>.105</u>
TOTAL	<u>3.578</u>	<u>3.432</u>
<u>Rocky Mountain</u>		
Wellhead Price (35°)	3.050	
Gathering	.100	
Pipeline Tariff	.350	
Pipeline Allowance	<u>.018</u>	
TOTAL	<u>3.518</u>	
<u>West Texas Sweet</u>		
Wellhead Price (35°)	3.050	
Gathering	.050	
Pipeline Tariff	.400	
Pipeline Allowance	<u>.018</u>	
TOTAL	<u>3.518</u>	

a 3 cents per 100 barrel-miles.

b Including Superior-Chicago at 3.7 cents per 100 barrel-miles.

c At \$1.05 U. S. per \$1.00 Canadian.





30. Canadian crude oil is currently competitive with U.S. crudes at Sarnia. If Canadian crude were to compete with U.S. crude in, say, the Detroit area, it would have to equalize at a lower delivered price, incur an extra transport charge, and absorb the U.S. duty -- all of which adds up to about 15 cents. A similar relationship prevails in the Chicago area, although the cost disadvantage is less. (See Tables 10 and 11.)

31. Thus, Canadian crudes would have to establish a competitive position either by a reduction in wellhead prices or in transportation charges. If a through-tariff of Interprovincial to the Sarnia-Detroit area could be reduced to, say, 3 cents per 100 barrel-miles, Canadian crude oil could be delivered at approximately competitive prices with U.S. crudes in the Detroit area. Similarly, if an extension of Interprovincial to the Chicago area would permit such a lower rate, Canadian crude would lay down for less than U.S. crudes.

32. Farther to the east, in the Buffalo area, the disadvantage to Canadian crude would be somewhat smaller than at Detroit, since the movement would be with, rather than against, the main stream of U.S. crudes over most of the distance. Refineries in this area could be served by deliveries from Interprovincial's new terminal in the Hamilton area. The disadvantage to Canadian crudes, at present pipeline tariffs, would amount to about 10 to 12 cents a barrel. At a through rate of 3 cents per 100 barrel-miles, Canadian crude could be laid down more cheaply than U.S. crudes are at present.

33. As in the case of the West Coast, there are opposing considerations with respect to the prospects for Canadian oil in the U.S. Midwest, once a competitive cost position is established. The fact that many Midwest refiners are among the heaviest net crude buyers in the United States would certainly weigh in favor of Canadian crude. Competitively priced Canadian oil could be commercially attractive to such companies, where they might not be for companies who have access at the coasts to low-cost foreign supplies. Many of these Midwest companies are active in Canadian oil development. And the more the East-of-Rockies area moves toward a deficit position, the stronger the inducements for the import of Canadian crude. Finally, such a flow of Canadian crude over inland routes would constitute a secure source of supply, which would be of greatest significance to the national security.\*

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\* In this respect, it is noteworthy that an ODM staff memorandum in May 1956 identified the Lakehead and Interprovincial Pipelines as potential carriers of critical crude supplies eastward, in evaluating the U.S. defense position in time of emergency.



34. There are, however, countervailing considerations. In the first place, the timing and extent of an East-of-Rockies deficit position hinges on greater uncertainties than on the West Coast. A leveling-off in California production has been substantiated by the experience of recent years; and while the future of off-shore efforts is unknown, there is fairly general acceptance of the conclusion that total producibility on the West Coast will not be able to keep pace with the expansion in requirements. East of the Rockies, however, there are still potentialities for considerable exploration and development. Forecasts of dire oil shortages have recurred in the past -- always for some 10 years in the future -- and then have been upset by a combination of intensified effort and the fortunes of finding oil. The Rocky Mountain area, for example, has been the most rapidly expanding producing region in the United States since the war, with an average rate of increase of 12 per cent per year. Should this area continue to yield substantial reserves over the years ahead, the Midwest market would constitute an obvious outlet, and the climate for Canadian imports would be correspondingly less favorable.

35. Moreover, the pressure of foreign crudes in U.S. coastal areas is likely to increase, rather than diminish, so that a continued large surplus from the Southwest (as well as the Rocky Mountains) will probably be available to meet the needs of the Middle West. Such a flow pattern, which would be in accordance with the basic transport economics discussed earlier, would again militate against the acceptance of Canadian crudes. In addition, Midwest refiners are active participants in the large crude oil pipelines connecting Southwest, Midcontinent and Rocky Mountain producing areas with Midwest refining centers.

36. Finally, an increasing number of Midwest refiners have recently acquired promising acreage abroad, particularly in Venezuela. Any large discoveries by these refiners would give rise to strong pressures for utilizing this crude, conceivably even in the interior of the U.S. where it would inhibit the expansion of markets for Canadian oil. If important discoveries should be made by Midwest refiners in their overseas exploration, it is possible that these sources would no longer constitute a residual supply (as assumed in the projections for 1965), but that foreign crudes would be imported into inland as well as coastal areas. It is noteworthy that in recent hearings before the Administrator of the U.S. import program, several Midwest companies referred explicitly to their potential for expanded production abroad and indicated that such production would have to be brought into the United States in order to protect their foreign investments. Whether such oil is traded-off on the East Coast for U.S. crudes, refined on the East Coast with products moving westward, or





brought directly into Midwest refineries,\* it would in any case conflict with the potential marketing of Canadian crudes by virtue of its commercial attractiveness to companies involved in foreign oil development.

37. It is impossible to strike a balance between these opposing considerations with very great confidence. As contrasted with West Coast prospects, the competitive cost position of Canadian crudes would first have to be established, but this does not involve so large a margin as to close the door against the possibility. But commercial considerations of individual companies are not apt to be so formidable. The final conclusion hinges on two closely interrelated uncertainties, the pressure of U.S. domestic crudes seeking their own natural market and the availability and attractiveness of foreign crudes -- both in turn depending on U.S. import policy.

### Montreal

38. As noted above, Alberta crudes enjoy a locational advantage over other foreign sources in the San Francisco area, and could establish a pro forma competitive position there at pipeline tariffs that would be reasonable under conditions of expanded throughput. In the Midwest, Canadian crudes would have to overcome a competitive disadvantage against U.S. crudes, but the difference could apparently be subsumed by a reduction in pipeline through rates that is within the range of experience, or a modest reduction in wellhead prices, or a combination of the two. In the case of moving Canadian crude to Montreal, the competitive problems are more acute. To reach Montreal, Canadian oil must span a distance as great as that from Venezuela, and at the much higher costs associated with overland transportation.

39. A second factor which would affect the competitive position of Canadian crudes relative to foreign supplies at Montreal is the effect of U.S. import duties on the f.o.b. prices of foreign crudes. Venezuelan oil, which constitutes the main supply stream for Montreal refineries, also moves in substantial quantities to the U.S. East Coast. Over a recent three month period (June to August, 1957), for example, East Coast refinery runs in the United States averaged 1,245,000 barrels per

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\* The first possibility is already a fact, although on a modest scale thus far; the second will become a factor of considerable weight when the Laurel Pipeline is completed next year from Philadelphia to Cleveland; the third is at least under active consideration.



TABLE 12

## COMPARISON OF LAID-DOWN CRUDE OIL PRICES AT MONTREAL

<u>Canadian</u>			
Wellhead Price (Redwater 35°)	2.630		
Pipeline Charges to Edmonton	<u>.073</u>		
	2.703		
Pipeline Tariff to Sarnia	.624		
Estimated Tariff			
Sarnia-Montreal	.182 <sup>a</sup>		
Pipeline Allowance	<u>.018</u>		
TOTAL	<u>3.527</u>		
	At USMC	At USMC	
	<u>-30 Per Cent</u>	<u>-45 Per Cent</u>	
<u>Venezuelan</u>			
F.O.B. Puerta la Cruz			
(Oficina 35°)	3.050	3.050	
Tanker Rate to Portland	.279	.219	
Insurance and Loss	.038	.038	
Portland-Montreal			
Pipeline Tariff	.110	.110	
Pipeline Allowance	<u>.017</u>	<u>.017</u>	
TOTAL - U.S. \$	3.494	3.434	
Canadian \$ <sup>b</sup>	<u>3.327</u>	<u>3.270</u>	
<u>Middle East</u>			
F.O.B. Ras Tanura (35°)	2.100	2.100	
Tanker Rate to Portland	1.180	.927	
Insurance and Loss	.038	.035	
Portland-Montreal			
Pipeline Tariff	.110	.110	
Pipeline Allowance	<u>.017</u>	<u>.016</u>	
TOTAL - U.S. \$	3.445	3.188	
Canadian \$ <sup>b</sup>	<u>3.280</u>	<u>3.035</u>	

a At 3.6 cents per 100 barrel-miles.

b At \$1.05 U.S. per \$1.00 Canadian.





day, of which 795,000 barrels daily represented foreign crude. Imports from Venezuela amounted to 515,000 barrels daily (imports from the Middle East, to 275,000 barrels daily). Venezuelan crude, to be competitive with the flow of U.S. crudes from the Gulf Coast, must overcome a U.S. tariff of 10.5 cents per barrel (5.25 cents per barrel for heavy crudes). Thus, f.o.b. prices of Venezuelan crudes tend to reflect the U.S. duty,\* and are available for lifting to Canada where they are not required to carry the added cost of a Canadian crude oil tariff.

40. On the basis of current wellhead prices, the present pipeline tariff to Sarnia, and an assumed extension to Montreal at the prevailing barrel-mile rate, Canadian crude would, therefore, be at a considerable disadvantage in competing with foreign crudes. At tanker rates of USMC-30 per cent, the handicap would be at least 20 cents; at lower tanker rates which are consistent with large volume, continuous flows (i.e., USMC-45 per cent), it would be around 25 cents per barrel.\*\* (See Table 12.) The competitive advantage of Middle East oil, moving over a longer haul, increases more rapidly than Venezuelan supplies at lower tanker rates. In the discussion that follows, however, we consider the problem in terms of competition with Caribbean supplies, since these have constituted the main stream of foreign crudes. Canadian crude would thus have to overcome a substantial cost disadvantage before it could attain a competitive position at Montreal refineries, simply on the basis of posted prices.

41. Turning to the narrow problem of competitive laid-down prices at Montreal, the present cost disadvantage of Canadian crudes could be offset by the following: (a) a reduction in Canadian wellhead prices; (b) lower pipeline through rates over Interprovincial; (c) a change in Dominion policy toward an import duty on crude oil; (d) various combinations of these possibilities.

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\* For example, when the U.S. duty on heavy crudes was reduced from 10.5 to 5.25 cents per barrel in 1952, Lagunillas crude, f.o.b. Amuay Bay, Venezuela, was raised by 5 cents.

\*\* As in previous comparisons, no allowance has been made for quality differences. For most refiners, Canadian crude would probably carry a small premium over Venezuelan (Oficina) crude; the differential over some Middle East crudes is substantially higher, and has been cited at 16 cents per barrel. However, relative valuations, as noted previously, would depend on the precise qualities of the crudes, yield patterns and product prices, and the technological facilities of individual refiners.



42. In the past, a major downward adjustment in Canadian wellhead prices (29 to 44 cents per barrel) was incurred when Canadian crude first reached the Ontario market. A further advance, against the incoming stream of low-cost foreign crudes, would probably involve a further mark-down in wellhead prices. If pipeline rates could be reduced below those assumed in the previous cost comparisons, however, then the reduction in wellhead prices would obviously not have to be so large as to subsume the entire 25-cent disadvantage that now exists.

43. The practicability of reduced pipeline charges rests on two considerations. First, the effect of heavier throughput on the over-all level of Interprovincial rates. Second, the possibility of adjustments in the pipeline's tariff structure so as to lower transportation costs over the long haul.

44. With respect to the overall level of pipeline rates, it is difficult to pin-point the exact effect of increased throughput. In general, as a line's operations approach capacity, average barrel-mile costs tend to decline sharply, permitting lower rates. But then further costs are incurred in boosting capacity. The further increases in capacity are carried beyond the original design of the line, the greater such costs will be. Within each step, optimum rates of operation will permit minimum rates. Substantial movements of Canadian crude to Montreal would involve not only a link between Toronto and Montreal, but sufficient capacity all along the line from Alberta and Saskatchewan. It is important to recognize, therefore, that the extension into Toronto will in the future involve considerable expansion of Interprovincial's capacity, as Canadian crude increasingly fills Toronto's expanding refinery requirements. If such expansion is planned so as only to accommodate Toronto requirements and presumed sources of supply in Saskatchewan and Alberta, then the Montreal market will continue to pose new and expensive problems in transportation logistics. If the Montreal market is integrated into future planning, the combined problem would presumably be less imposing than separate provisions for first Toronto and then Montreal.

45. Of immediate interest, too, is the whole question of the structure of rates along the Interprovincial line. The present tariff structure already provides for a decreasing barrel-mile rate schedule. This obviously was required to facilitate the movement of Canadian crude to Sarnia. Under present arrangements, it would be unrealistic to contemplate a lower through rate to Montreal which either affected adversely the earning capacity of pipeline operations as a whole, or compensated the pipeline through higher rates elsewhere at the expense of refineries at closer destinations.





TABLE 13

CURRENT AND POSSIBLE TARIFFS, INTERPROVINCIAL PIPELINE  
TO ABSORB TEN-CENT REDUCTION IN RATE TO MONTREAL

	<u>Distance</u> <u>(Miles)</u>	<u>Current</u> <u>Tariff</u>	<u>Cents</u> <u>Per 100</u> <u>Barrel-Miles</u>	<u>Proposed</u> <u>Tariff</u>	<u>Cents</u> <u>Per 100</u> <u>Barrel-Miles</u>
<u>Edmonton to:</u>					
Milden	300 <sup>a</sup>	16.5	5.50	23.0	7.67
Moosejaw	408 <sup>a</sup>	21.5	5.27	30.0	7.35
Regina	438	23.5	5.37	31.5	7.19
Souris	650 <sup>a</sup>	32.0	4.92	41.0	6.31
Gretna	772	36.0	4.66	45.5	5.89
Clearbrook	907 <sup>a</sup>	41.0	4.52	49.0	5.40
Wrenshall	1,080 <sup>a</sup>	44.0	4.07	53.0	4.91
Superior	1,098	44.0	4.01	53.0	4.83
Sarnia	1,741	64.0 <sup>b</sup>	3.68	71.0	4.08
Toronto	1,897 <sup>a</sup>	69.0 <sup>b</sup>	3.64	71.5	3.77
Montreal	2,247 <sup>a</sup>	82.0	3.64	72.0	3.20
<u>Kerrobert to:</u>					
Regina	220 <sup>a</sup>	16.0	7.27	18.0	8.18
Clearbrook	689 <sup>a</sup>	32.0	4.64	40.0	5.81
Sarnia	1,523 <sup>a</sup>	58.0	3.81	65.0	4.27
<u>Regina to:</u>					
Clearbrook	469 <sup>a</sup>	25.0	5.33	34.0	7.25
<u>Cromer to:</u>					
Gretna	175	12.0	6.86	15.5	8.91
Superior	501	28.0	5.59	34.0	6.79
Sarnia	1,144	48.0	4.20	55.5	4.85

a Estimated.

b Hypothetical rates.



46. An alternative that avoids both of these difficulties might be found in parallel adjustments of wellhead prices and pipeline tariffs. For example, a 10-cent reduction in wellhead prices could be coupled with a 10-cent lower pipeline tariff from Edmonton to Montreal than the present rate structure comprehends. This would reduce the cost of Canadian crude at Montreal by 20 cents per barrel. Interprovincial might then realize the same total revenue by raising tariffs for intermediate deliveries. But this would not adversely affect refiners along the line since they would benefit from the reduced wellhead prices. Table 13 illustrates a tariff schedule which incorporates these features. The total charge to Montreal is shown at 72 cents (3.2 cents per 100 barrel-miles), as against 82 cents (3.6 cents per 100 barrel-miles) as is implied in existing tariffs. To Clearbrook, the rate could be 49 cents as against 41 cents, but the delivered cost of Alberta crudes would still be 2 cents less since wellhead prices would be 10 cents lower. At Sarnia, the tariff would be 71 cents as against 64 cents, for a net reduction to refiners of 3 cents in laid-down cost. The total revenues to Interprovincial would be the same as (actually slightly higher) under the existing tariff structure.

47. In planning ahead, therefore, future throughput potentialities and capacity requirements might permit a simultaneous review of the level and structure of rates, so that all refiners share in whatever rate reductions might be possible, the while maximum contribution is made towards the competitive position of Canadian crude in the Montreal market.

48. At the same time, it would still appear that Canadian wellhead prices would have to subsume a part of the cost of achieving competitive equality with foreign crudes on a posted price basis. If the amounts of the reduction were modest (i. e., 10 cents per barrel), the producing segment of the Canadian industry might find that the loss in price would be offset in large part, if not in entirety, by the effect of higher rates of operations on the current and future value of reserves.

49. Table 14 illustrates the offsetting effects of a modest crude oil price reduction accompanied by accelerated production. With proved reserves of 2,500 million barrels and production of 500,000 barrels per day, a wellhead price of \$2.50 per barrel would represent a discounted value of reserves of \$1.78 per barrel (assuming a 5 per cent per annum rate of discount against future production). Looking ahead ten years, if production increases at the rate of 5 per cent per year and reserves are proved up to sustain the 13.7-year ratio of reserves to production, the discounted value of reserves would carry forward at \$1.78 per barrel.





TABLE 14

DISCOUNTED VALUE OF FUTURE PRODUCTION  
AT ALTERNATIVE RATES OF PRODUCTION AND WELLHEAD PRICES

	<u>Present</u>	<u>Ten Years Hence</u>
<u>CASE A:</u>		
Reserves (millions of barrels)	2,500	4,073
Production (thousands of barrels daily) <sup>a</sup>	500	815
per year (millions of barrels)	182.5	297.3
Reserve to production ratio (years) <sup>b</sup>	13.7	13.7
PRICE	\$ 2.50	\$ 2.50
Value of annual production (millions)	\$ 456	\$ 743
Discounted value of reserves (millions) <sup>c</sup>	\$4,445	\$7,245
per bbl.	\$ 1.78	\$ 1.78
<u>CASE B:</u>		
Reserves (millions of barrels)	2,500	4,994
Production (thousands of barrels daily) <sup>a</sup>	700	1,140
per year (millions of barrels)	255.5	416.2
Reserve to production ratio (years)	9.8	12.0
PRICE	\$ 2.40	\$ 2.40
Value of annual production (millions)	\$ 616	\$ 999
Discounted value of reserves (millions)	\$4,660	\$8,854
per bbl.	\$ 1.86	\$ 1.77

a Growth at rate of 5 per cent per year.

b In Case A, the reserve ratio is assumed constant; in Case B, the lower initial ratio is assumed to increase over the period, but remains below that of Case A because of higher rate of production.

c Discounted at 5 per cent interest rate.



50. If production in the initial period could be raised to 700,000 barrels per day, a price reduction of 10 cents to \$2.40 per barrel would be more than offset by the higher rate of operations, and the discounted value of reserves would be \$1.86 -- 8 cents more than at the lower rate of output. Again, looking ahead, if the higher rate of production advances at the rate of 5 per cent per year, it builds up to a substantially greater volume than in the first case. Assuming that reserves are developed so as to result in a 12-year ratio to production, the discounted value of reserves would then come to \$1.77 per barrel -- only 1 cent below the value at a higher price but slower rate of production.\*

51. From another perspective, the higher rate of production over a ten-year period would yield a greater total revenue and would support a considerably greater development program: i. e.,

	<u>Case A</u>	<u>Case B</u>
Total revenues	\$6.0 billion	\$8.1 billion
Gross addition to reserves	4.0 billion bbls.	5.9 billion bbls.
Revenue/gross additions to reserves	\$1.51/bbl.	\$1.37/bbl.
Year end reserves after 10 years	4.1 billion bbls.	5.0 billion bbls.

While these figures are merely illustrative of the offsetting effects of a crude price reduction that is accompanied by increased rates of production, they highlight a consideration that would have to be weighed in the balance as between the costs vs. benefits of an eastward expansion of Canadian crude markets.

52. A final consideration would be the effects of a Canadian import duty on foreign crude oil as a means of improving the competitive position of Canadian crudes. The many implications of tariff policy are reviewed in detail in Part III. Here we note merely those points that are particularly relevant to the prospects for Canadian crude in the Montreal market. We have already referred to the fact that Venezuelan crudes, moving to Montreal, are, in general, competitive with U. S. crudes on the East Coast after carrying the U. S. import duty, but move into Canada free of Canadian tariff. In a sense, therefore, a Canadian duty equal to that of the United States would merely tend to offset this adverse effect of the U. S. tariff.

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\* The reserve/production ratio is, of course, critical in this comparison, but the alternative assumptions in Table 14 do not appear unreasonable.





53. An import duty which might be imposed at a time when Canadian crude does not move beyond Ontario, and equalizes with U.S. crudes at Sarnia, could lead directly to higher wellhead prices. This would, of course, have an opposing effect on crude producers and refiners. If, however, a duty were imposed whilst Canadian crude was entering Montreal and establishing its competitive position against foreign crudes in the more distant market, it would probably still require some reduction in wellhead prices. The interior refining industry which now operates on Canadian crude would not be adversely affected therefore. The advantage to the Canadian producing industry, in turn, would be limited to the effectiveness of the duty in extending the marketing area for Canadian crude.

54. So far as Eastern Canada is concerned, an import duty would, of course, lead to higher crude costs. However, since local refinery output is supplemented by substantial product imports, product prices have to cover two elements of cost that are not encompassed in refinery operations. The first is a relatively higher transport cost for imported products than for imported crude. (a) The flow of products, which is not on as large or continuous a basis as that of crudes, does not benefit from as low a level of tanker rates as the crude movement to Montreal refineries. (b) Products must be shipped via the St. Lawrence, whereas the transportation of crude benefits from the availability of the Portland-Montreal pipeline.

55. Furthermore, product prices enjoy the protection of import duties on refined products which amount to about 18 cents per barrel (at Most-Favored Nation rates). Since product prices in eastern Canada involve a parity with imported products, a crude oil duty might not affect final prices so much as refinery margins.

56. The discussion thus far has concerned only the narrow problem of competitive equality at Montreal between Canadian crudes and foreign crudes, on the basis of respective f. o. b. prices. But companies that operate refineries in Montreal have other strong commercial reasons for turning to foreign crude supplies. Many of them have access to their own production in Venezuela and the Middle East. Large foreign reserves and low replacement costs combine to provide a powerful incentive toward the continued use of these overseas supplies. Even long-term purchase contracts may provide the refiners with foreign crudes substantially below the delivered prices assumed in calculations based on posted prices. These commercial considerations of individual companies pose a range of problems similar to those faced by Canadian crude in the San Francisco market, with the difference that Montreal operations are "national" to Canada while San Francisco operations are "foreign".



57. In addition, if Montreal refiners were to switch from imported to domestic crudes, existing pipeline facilities might be made partly or wholly obsolete. These include the Portland-Montreal crude oil line and the Trans-Northern line moving products from Montreal to Toronto and Ottawa. The latter, of course, could probably be reversed to facilitate the early flow of Canadian crude into Montreal. It should be noted, in any case, that every eastward extension of the market for Canadian crude has caused some facilities to become superfluous; these are among the costs that inevitably accompany major shifts in the orientation of marketing and distribution.

58. Finally, the Montreal market could also be of considerable importance to the parent companies of Montreal refiners because it provides a source of hard currency sales. But this very consideration which may weigh heavily from a commercial point of view could carry quite the opposite weight from a national point of view. Crude oil imports, at \$271,000,000 in 1956, were an imposing item in Canada's deficit of \$734,000,000 in the balance of trade. This aspect of Canadian oil production and marketing, however, goes beyond the question of crude oil supplies at Montreal. The contribution to the national balance of trade would be equally significant were Canadian oil to find an expanded export market in the United States or replace foreign crude in eastern Canada.

59. The review of logistics, competitive crude oil prices, and broader commercial interest of integrated companies in the Montreal area indicates that Canadian crude will find great difficulty in obtaining access to the Montreal market. On the other hand, reference has been made to possible changes in crude oil prices, pipeline tariffs and an import duty on crude oil which might help overcome some of the current obstacles to such an eastward extension. The sense of urgency in overcoming these difficulties must of course depend on a consideration of what is desirable for the Canadian oil economy as a whole. If prospects in the absence of access to the Montreal market appear to fall short of the goal of balanced growth of the Canadian economy and its natural resources, then a solution of the problem might well become a matter of national policy.

### Summary

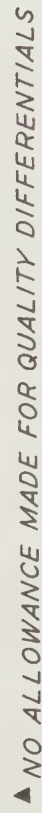
60. The review of market alternatives for an expanded flow of Canadian crude thus indicates:-

The West Coast is the area in which Canadian crude would be most competitive. It provides outlets which





AT SAN FRANCISCO      AT CHICAGO      AT MONTREAL





fit most closely the logistics of U. S. -Canadian supply-demand balances. And it need not have the adverse effect on Canadian wellhead prices which movements to other markets would probably entail. The obstacles are largely those of normal commercial motivation among individual companies; the prospects of acceptance for Canadian crudes would seem to depend largely on U. S. policy with respect to the imports of foreign crude into the West Coast and the possible preference which might be established as among alternative foreign crude sources.

The Midwest involves direct competition with the main stream of U. S. crudes. Canadian prices and/or transport costs would have to be reduced. At the same time, U. S. crudes will probably be pressed increasingly into this interior area by the movement of foreign crudes to both coasts. And the already rapid development of Rocky Mountain production suggests that these crudes will be moving directly into the line of Canadian crude flows. Individual company considerations may be less of an obstacle in the short run than in the case of California. Many Midwest refiners are among the heaviest net crude oil purchasers in the United States and are actively engaged in Canadian operations, so that Canadian supplies, if advantageously priced, may not represent an unattractive possibility as against U. S. crudes. Looking further ahead, however, these same companies are also active in overseas exploration; this could lead to substantial foreign imports in the future, either for direct use or by trading-off for domestic supplies. Again, U. S. import policy could play a decisive role, but that it would suffice to establish Canadian crudes firmly in major Midwest refining centers-- even if competitive price equality were realized -- also remains uncertain.

61. The prospects for an expanded export market in the U. S. thus hinge largely on commercial considerations of individual companies together with the import policy pursued by the U. S. government. Favoring Canadian crude is the large and diversified U. S. investment in Canadian oil development. To the extent, however, that such investment is paralleled by overseas investment, foreign supplies, by reason of cost and relative political insecurity, may be continuously regarded as an earlier and preferred source to Canadian crudes by individual companies.





62. With respect to U.S. government policy, the close economic ties between the two countries should be reflected in a generally favorable environment for the Canadian oil industry. More specifically, considerations of national security which are the stated basis for U.S. import policy militate in favor of Western Hemisphere preference, and Canadian crudes are apt to be regarded as a continental source of supply of maximum security. But whether these considerations could be translated into effective demand for Canadian crudes must remain uncertain. Much would depend on the extent of U.S. dependency on foreign oil as against the pressure of domestic capacity. And the implementation of Western Hemisphere preference is confounded by a wide range of economic and political commitments by the U.S. government in other parts of the world.

63. If the possibilities of exports to the United States appear to be adequate to the future development of the Canadian oil economy, and the uncertainties attaching to market expansion in the U.S. are not too discouraging, then Canadian crude may reasonably await future expansion without actively seeking an outlet in Eastern Canada. Restricted operations in the interim would be the cost of sustaining wellhead prices. And heavy investment in pipeline facilities eastward would be in part avoided (although expansion of facilities for the Ontario market will undoubtedly be required).

64. If, on the other hand, the uncertainties of the U.S. export market appear to inhibit the balanced development of the Canadian oil economy, or the cost of waiting for expanded market opportunities in the U.S. is regarded as too high, then penetration of the Montreal market may be the only answer.

The Montreal market is certainly not an obvious direction of expansion from a logistic point of view. And it poses the most difficult problems even in the narrow context of competitive price relationships. These, however, could apparently be overcome. There would still remain, however, the compelling commercial preference for foreign crude oil imports among integrated companies in Montreal refining.

65. Thus, even if Canadian crudes could be made competitive with foreign supplies at Montreal, given f.o.b. price and transportation relationships, access to the Montreal market would have to be further supported as a matter of deliberate policy.



### PART III

#### SOME ASPECTS OF PUBLIC POLICY

1. In Part II we reviewed the difficulties that Canadian crude would have to overcome in order to expand its market orbit. Among these difficulties were those involved in establishing a competitive relationship between Canadian crudes and alternative supplies, considering only the posted prices and transportation costs of the respective crudes. What such a pro forma competitive position might involve with respect to Canadian wellhead prices, or might require with respect to reduced pipeline tariffs, is tolerably measurable; and a balance could be struck between the benefits of increased production together with accelerated development as against the costs of achieving those goals.

2. More critical, however, is the uncertainty that Canadian crude would find a substantial and continuing market even if Canadian oil could be delivered to these distant markets at a cost comparable with that of alternative supplies on an f. o. b. -plus-transportation basis.\* In the potentially large U. S. markets for Canadian exports, Canadian crude is either a foreign oil competing with domestic supplies; or one among foreign oils competing for a limited import position. And among foreign crude oil supplies, the importer can acquire it only on a prorated basis, purchased oil along with owned oil, whereas Venezuelan and Eastern Hemisphere crudes are available either as the production of affiliated companies or on a contractual basis at relatively favorable terms. At Montreal, domestic Canadian crude is faced with a natural commercial preference on the part of Canadian refineries that parallels the interest of U. S. refineries for

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\* Discussing the alternative markets for Canadian crude, exports to the United States or eastward to Montreal, the Royal Commission's study on Canadian Energy Prospects concluded: "It is difficult to say which view will prevail. Obviously, the outcome is contingent, more on future United States policy than anything else. Should Canadian oil continue to be proven up at a healthy rate and shut-in production in this country grow as a consequence of U. S. import quotas, then Canadian production will find its way in volume into Quebec. On the other hand, an early scarcity of domestically-produced oil in the United States could prevent such a development from reaching major proportions. In what follows, it has been assumed that Canadian oil, for lack of adequate export markets, will begin to move in some volume into Montreal in or about 1960. Subsequently, and especially after 1965, it was thought that market extensions in the United States would account for the major increase in Canadian crude sales." (p. 127)





foreign supplies. As was pointed out above, a realistic evaluation of the opportunities for Canadian crude in the United States, or alternatively in Montreal, depends on the course of public policy, in the first instance of U.S. policy, in the latter instance, of Canadian policy.

3. In the sections that follow we review first the development of U.S. import policy and its most likely effects on Canadian crude oil exports. Subsequently, we discuss some of the knotty problems facing Canada in pursuing its own national policy with respect to the development of its crude oil resources. We would emphasize, perhaps unnecessarily, that references to public policies either in the United States or in Canada are not intended, nor should they be construed, as implying approval or criticism. The formulation of public policy must rest on broad considerations of national interest that are the appropriate concern of the respective governments. In the discussion that follows we presume only to treat with the implications for the Canadian oil producing industry of alternative policies that may bear closely on its problems and prospects.

## U. S. Import Policy

### The West Coast

4. As was indicated in the early sections of Part II, the United States, particularly the West Coast, represents in many ways a natural market for Canadian crude. The U.S. West Coast is already a deficit area, requiring foreign crude oil supplies to supplement domestic production, and Canadian crude is advantageously located to meet West Coast import requirements. Over the years ahead, import requirements are expected to increase sharply, but in view of the commercial attractiveness of other foreign crudes, Canada's share in the import total will depend in large measure on U.S. import policy.

5. The current phase of U.S. import policy dates back to a Cabinet Committee's recommendations in February 1955 that imports of crude oil and residual fuel oil should be held at their 1954 ratios to domestic crude oil production. The intent was to maintain the incentives for domestic exploration and development because of the strategic importance of both discovered reserves and productive capacity to the national security.

6. In 1954, crude oil imports into the West Coast amounted to 50,000 barrels per day (and represented 5.23 per cent of crude oil



production in that district), with virtually no Canadian crude coming in. Subsequently with the completion of the Trans Mountain Pipe Line and the construction of refining capacity in the Pacific Northwest, Canadian crude began to move into that area. At the same time, imports from overseas sources also increased.

7. Beginning late in 1955, the Director of the Office of Defense Mobilization became concerned with the potential impact of increasing crude oil imports on the domestic industry and called upon importing companies voluntarily to limit their recourse to foreign crudes. But his request for voluntary import restrictions specifically exempted imports into the West Coast. (The position of Canadian crude East of the Rockies is reviewed in later sections.) This exemption was repeated in his letters to importing companies during 1956, and the ODM Director's interpretations of U.S. import policy were endorsed in a special review by a Cabinet Committee in October 1956. By January/September 1956, West Coast imports had risen to 175,000 barrels per day (representing 17.95 per cent of domestic production in District V), with Canadian imports accounting for 60,000 barrels per day (6.12 per cent of District V production).

8. At the present time, restrictions on West Coast imports are about to be applied. Present policy has emerged from recommendations formulated by a Special Cabinet Committee in July 1957.\* The findings of the committee that are relevant to West Coast imports are as follows:

The geographic separation of Districts I-IV and District V is such that transportation of crude oil or refined products from one region to the other is not being provided in such quantities as to meet the total demands of District V. \* \* \*

Commercial production in District V, which is represented almost entirely by California oil fields, is not controlled by regulatory bodies and is at as high a level as is consistent with sound engineering practices. Nevertheless, production is declining steadily and imports are necessary to meet the demand.

\* \* \* in District V imports will be restricted to the difference between demand and the domestic crude oil that can be made available to the area on a reasonably competitive basis.

Imports should be determined on a semiannual basis.  
Pending a change in the deficit condition now pending

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\* The occasion for the 1957 review of import policy by the special committee is discussed below in connection with U.S. import policy for districts East of the Rockies.





in the area by, for example, the development of an economical means of interregional transportation, the level of imports must be such as to make up the difference between the demand and the quantity of domestic crude oil available to the area \* \* \* \*

Thus, while no limitations were requested then on West Coast imports, a ceiling was indicated beyond which crude oil imports would be deemed injurious to domestic industry.

9. During the last half of 1957, West Coast imports will average about 295,000 barrels per day, more than 100,000 barrels daily over 1956 and slightly above the desirable level indicated in the Cabinet Committee's mid-year report. Imports from Canada will average around 75,000 barrels daily, only modestly above last year's volume up to the time of the Suez crisis; thus the bulk of the increase has come from overseas sources. Meanwhile, new factors are entering into the West Coast supply-demand balance. Domestic demand on the West Coast has lagged behind earlier expectations, West Coast production has continued at capacity, and both crude and product stocks have been built up. The Four Corners Pipeline is scheduled to commence deliveries of domestic crude in the Los Angeles area by February of next year, with a throughput capacity of 70,000 barrels per day. Domestic producers have therefore urged a voluntary ceiling on imports, to be administered via individual company quotas similar to those in force on the East Coast. During recent hearings before the Administrator of the Voluntary Oil Import Program, refining companies have taken positions which range from (a) a strong appeal that imports be limited to supplemental needs (Union Oil Co.); (b) an acceptance of the desirability of restricting imports to supplemental needs, but without any current urgency for import controls (General Petroleum); to (c) a strong case for unlimited imports to meet the West Coast's increasing deficits over future years (Tidewater). Import schedules submitted by individual companies indicate that foreign crude receipts would run to 350,000 barrels per day in the first half of 1958. Again, the bulk of the increase would represent overseas supplies.

10. According to reports, the Cabinet Committee that has reviewed West Coast import policy will recommend that a ceiling should be set for West Coast imports. That ceiling will involve a cutback of 100,000 barrels per day or more below the scheduled volume. Major importers (including all those companies that now import Canadian crude into the Puget Sound area) would be requested to reduce their imports during the first half of 1958 15 per cent below their 1956-57 average. Smaller importers and new importers who have presented 1958 programs would be permitted to fulfill their 1958 schedules, except that the former would be limited to no more than 3,000 barrels daily over their 1956-57 average



and the latter to an absolute quantity of 3,000 barrels daily. Other companies who may desire to import crude oil in the future will be required to give six months' notice of their intention, and the Administrator would then recommend an appropriate "quota". Should companies now taking Canadian crude affect their required reduction proportionately among their various foreign crude sources, this would imply a reduction of around 9,000 barrels daily in the flow of Canadian crude (taking 60,000 barrels daily as the regular flow during the base years and excluding emergency shipments). In view of already reduced schedules for Canadian imports in early 1958, the actual cutback below the volume programmed might be only about half that figure. In fact, however, companies could apportion their cutbacks according to individual circumstances. Canadian crude might continue to be taken at scheduled rates if Puget Sound refiners decide to hold to their recent supply arrangements; Canadian crude could be cut back even more if the incentives to bring in overseas production within a limited ceiling are sufficiently impelling.

11. The circumstances pointed up in the cabinet decision will continue to play a role in the future, with perhaps changing emphasis from time to time depending on the area's supply-demand balance. It is important, therefore, to review the alternative lines which U.S. policy might follow, and their significance for Canadian crude exports to the West Coast.

The while supplemental requirements are modest, the pressures will be strong to continue a definite ceiling on imports. So long as the import ceiling is implemented by individual company quotas with each company free to select from among alternative supplies available to it, the commercial interests of importers will militate strongly in favor of crude oil produced abroad by affiliates or advantageously available through direct purchase. Under these circumstances, Canadian crude is apt to find itself at a sharp commercial disadvantage all along the West Coast.

If an import ceiling in the future should be limited to California, with exemption for the Pacific Northwest, then Canadian crude could find its position in Puget Sound markets protected, especially if the exemption is tied to considerations of security and the availability of pipeline transport is stressed. But the incentive for importing refiners to preempt a limited import market in California with other foreign crudes would act to block off an expansion southward in Canadian markets. In this connection, it should be stressed again that in contemplating the probable rate of refinery





expansion at Puget Sound, the advantage of refining Canadian crude and marketing its products in the Northwest would have to be set against the commercial incentives for importing owned-crude from overseas sources into the Northwest (or California) and realizing the profits in both production and refining. At the same time, West Coast refiners have extensive interests in the development of Canadian oil, and this fact should play a role in the future position of Canadian crudes in West Coast markets.

This would be especially relevant when supplemental requirements for the West Coast become large. While Canadian crude may still be regarded as a balance between refinery requirements and the flow of domestic plus other foreign supplies arranged on a relatively continuous basis, Canadian crude could expect to find a substantial market within the large deficit that the West Coast has to make up.

12. The establishment of Canadian crude as a substantial and regular source of supply to West Coast refineries over the years immediately ahead would thus seem to depend on preferential treatment for Canadian crude; that is, Canadian oil to be regarded as an effective part of the domestic supply stream and not charged against an importing company's foreign take.\* This policy could develop as West Coast import requirements rise and to the extent that considerations of national defense would justify maximum emphasis on the most secure sources of supply. In this respect, the location of Canadian crude, the interior lines of supply via pipeline, and the close defense ties between the U. S. and Canadian governments would be important considerations. But recourse to Canadian oil on a regular basis by California refiners would probably hinge on the most explicit formulation of such an important policy by the U. S. government.

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\* It should be emphasized that if the U. S. should establish a policy of preference it would probably try to avoid any suggestion of discrimination, lest sensitive diplomatic relations with other oil exporting countries be impaired. Pipeline delivery from Canada might warrant consideration in this respect. Similarly Venezuelan and other Western Hemisphere crudes could probably warrant a position of preference consistent with their locational situation, perhaps on the East Coast.



## East of Rockies

13. The potential markets for Canadian crude in the U. S. Midwest are substantial, as indicated in Part II and developed in the Royal Commission's review of Canadian Energy Prospects (p. 138). But even if Canadian crude established a competitive position as against the costs of domestic crudes, its effective demand is apt to be constrained by a combination of factors involving the commercial considerations of individual companies together with U. S. import policy.

14. The 1955 report of the U. S. Cabinet Committee on Energy Supplies and Resources Policy called for limitation on imports at the 1954 ratio to domestic production. In 1954, East-of-Rockies imports came to 600,000 barrels per day and constituted 11.27 per cent of production in Districts I-IV. A subsequent rise in imports led the Director of ODM in 1955 and 1956 to call upon importing companies individually and voluntarily to reduce imports to that ratio.

15. There was, however, an important deviation by the ODM Director from the Cabinet Committee's broad recommendations. In calling for voluntary import limitations, he specifically exempted Canadian and Venezuelan crudes. This policy of preferential treatment was endorsed by the Cabinet Committee in its October 1956 review of import policy.

1. The imports of non-Canadian and non-Venezuelan crude oil into Districts I-IV should not exceed significantly during any quarter of the year 1957 the proportion that these imports bore to the production of domestic crude oil in those Districts in 1954.
2. Imports from Canada and Venezuela, although not included in Recommendation No. 1, should continue to be kept under close surveillance.

The Director of ODM, who was also chairman of the cabinet review committee, explained that policy in a speech immediately following the committee's recommendations:\*

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\* Remarks of Arthur S. Flemming before the annual convention of the Independent Petroleum Association of America at Dallas, Texas, October 29, 1956.





\* \* \* I want to review briefly our reasons for concentrating on the imports of non-Canadian and non-Venezuelan crude oil into Districts I-IV.

In all matters affecting national security we endeavor, wherever it is possible to do so, to treat the Western Hemisphere as an entity. The reasons for such an approach are clear to everyone.

In our letters to the oil importers, however, we have consistently stated that the imports of crude oil from Canada and from Venezuela should be kept under close surveillance. We have recognized that imports from these two sources could reach the point where they would constitute a real threat to our national security in that there would be inadequate incentive for the exploration and discovery of new sources of supply within our own country.

16. During this period, both Canadian and Venezuelan imports rose substantially. Canadian imports, which were negligible in 1954, increased to 50,000 barrels per day in January/September 1956; Venezuelan imports increased from 350,000 to 400,000 barrels per day. Together, these imports constituted 6.63 per cent of domestic production in 1954 and 7.34 per cent in 1956 -- and the rise constituted an important element in the overall expansion of East Coast imports relative to domestic production.

17. Toward the end of 1956, import schedules indicated a further rise and the Independent Petroleum Association of America petitioned the President to exercise his authority under the National Defense Amendment (Section 7) to the Trade Agreements Extension Act of 1955 "to adjust imports . . . to a level that will not threaten to impair the national security." The Suez crisis temporarily halted administrative action; but by the spring of 1957 the Director of ODM reviewed import schedules for the second half of that year and certified to the President that the scheduled volume of East Coast imports was excessive. At that time, importing companies projected their foreign crude oil receipts at 940,000 barrels per day (or 14.90 per cent of expected domestic production). Canadian crude, at 60,000 barrels daily, was only 10,000 barrels per day above 1956 levels; but major increases were scheduled for Venezuela and the Middle East.

18. Thereupon the President established a special cabinet committee again to review the import situation, and its report in July 1957 has become the basis of current policy. In effect, the cabinet committee



accepted the rise in imports through mid-1956, relative to domestic production, but acted to restrain any further increase.

\* \* \* Under normal peacetime conditions we believe that such a review should proceed on the assumption that in Districts I-IV an effort will be made to maintain a ratio between imports and domestic production of approximately 12.0% \* \* \*

It proposed to achieve import restrictions through voluntary limitations by individual companies to "quotas" recommended by the government. Established importers -- seven companies, each of whom had brought in 50,000 barrels daily or more of foreign crude in 1954 -- were asked to cut back during July 1957/June 1958 to a level 10 per cent below their own 1954-1956 average. Newcomers were permitted to meet their proposed schedules, except that no company was to exceed its 1956 imports by more than 12,000 barrels daily. No mention was made in the committee's recommendations of preference or exemption of Canadian or Venezuelan crude; thus each company was free to choose its own foreign source of crude oil within the limitations of its quotas. For the future, increases in crude oil imports East of the Rockies are presumably to be tied to the rate of growth in domestic demand and domestic production. Established importers and newcomers are to share equitably in that increase.

19. Under these import regulations, the position of Canadian crude in the Midwest is apt to be as follows:

Refineries that now take Canadian crude will probably be able to increase their imports automatically with the normal growth in demand, except insofar as increases in the overall quota are allocated to new importing companies, who are most apt to be concerned with bringing in overseas production. They may also be permitted to take larger quantities if it is shown that domestic crudes are not available because of lack of transport facilities.

Other companies would either have to charge Canadian crudes against their import "quotas",\* and suffer the commercial losses involved in foregoing low-cost imports of owned or purchased crudes from abroad; or

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\* In this connection, it may be worth noting that consideration could be given to U. S. crude being exported in determining a foreign crude oil quota for American companies. If this were so, the movement of Canadian crude into the U. S. Midwest might become attractive for U. S. companies who could export domestic crude to eastern Canada.





obtain an initial or increased "quota", either of which would involve a show of competitive hardship in refining and marketing or of foreign production which is least likely to require access to Canadian crudes.

Thus, Canadian crudes would not only be blanketed under the overall import ceiling, but suffer disadvantage as against competitive foreign crudes within that ceiling. This could be increasingly the case as more and more inland refiners become involved in foreign exploration,\* and as domestic crudes are pressed on mid-continent outlets for their markets.

### Imports and the National Security

20. In the evolution of U. S. oil import policy, two considerations have been expressed. On the one hand, the maintenance of incentives for domestic exploration and development requires that the overall level of crude oil imports be limited to quantities that supplement but do not supplant domestic production. In this respect, each barrel of foreign crude has the same effect, whatever its source. On the other hand, dependence of the United States on foreign crudes suggests that safe sources of supply may reasonably be granted preference over distant and vulnerable sources.

21. Such a preference on the grounds of national security was, as noted above, actually extended to Canadian and Venezuelan supplies under import policy during 1955-56. Indeed, the strategic ties between the United States and Canada with respect to allocation and use of resources have been fairly closely established in formal joint governmental statements and arrangements. It found expression in the Hyde Park Agreement of April 20, 1941.

\* \* \* Among other important matters, the President and the Prime Minister discussed measures by which the most prompt and effective utilization might be made of the productive facilities of North America for the purposes both of local and hemisphere defense and of the assistance which in addition to their own programs both Canada and the United States are rendering to Great Britain and the other democracies.

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\* The ways in which inland refiners may profit on the import of low-cost foreign crudes into the East Coast were referred to in Part II, pp. 16-17.



It was agreed as a general principle that in mobilizing the resources of this continent each country should provide the other with the defense articles which it is best able to produce, and, above all, produce quickly, and that production programs should be coordinated to this end.

During the 1948 fuel oil shortage in the United States, the U. S. Department of Commerce was able to announce the cooperation of the Canadian government:

Under the newly announced Canadian limitations, the import of these petroleum products from the United States during January will be reduced to a rate not to exceed six thousand barrels a day. The Canadian reduction of petroleum imports comes as a result of a cooperative effort between the Canadian and American Governments to solve the liquid fuel problems of the two countries.

In a Joint Statement of Principles on Economic Cooperation, the two governments concluded on October 26, 1950 that:

Barriers which impede the flow between Canada and the United States of goods essential for the common defense effort should be removed as far as possible.

Thus, the strategic importance of integrating resources of the two countries is well rooted in principle. And it has found express in practice.

### Canadian-U. S. Economic Relations

22. The considerations of national security that have led to integrated national policies with respect to the allocation of strategic resources are of course paralleled by extremely close economic ties between the two countries.

23. For Canada, these economic ties involve a substantial part of its foreign commerce, and therefore touch on the very heart of its productive activity. Last year, for example, Canada's exports to the United States accounted for about 60 per cent of its total exports; imports from the United States accounted for about 75 per cent of its total imports. Trade with Canada represented about 21 and 23 per cent of U. S. exports





and imports, respectively. Since trading relations with the United States are so critical to the welfare of the Canadian economy, it is perhaps inevitable that difficulties should arise from time to time as one country's foreign trade policy seems to affect adversely the interests of the other.

24. The vital role of this two-way flow of trade, and the irritations posed by specific policies, were the subject of a cabinet-level economic conference between the two countries in October of this year. At that time, the United States "stressed the dependability of the United States Economy both as a market and as a supply source." In the future, as in the past, each country can be expected to adopt policies which it feels are essential to its special needs and its self interest. But the close economic ties will probably always remain as a basic and continuing consideration.

#### The Canadian Oil Industry

25. With reference to the Canadian oil industry, the ties between the two countries are especially close. The following tables show the heavy role of U. S. investment in the development of the Canadian oil industry. Direct and portfolio investment by U. S. companies amounted to \$1,634 million at the end of 1955, and represented almost 60 per cent of total investment in the Canadian oil industry. Furthermore, the great bulk of U. S. investment has tended to be direct investment, while over one half of Canadian investment in the Canadian oil industry has been portfolio investment, almost half of which has been in U. S. -controlled companies. Reflecting the substantial portfolio investment by Canadians in U. S. companies, the total value of investment by U. S. -controlled companies operating in Canada came to \$2,054 million or nearly three-fourths of total investment in the Canadian oil industry.

26. While Canada will undoubtedly tend to provide an increasing share of its needed capital via Canadian investment in the future, the tremendous requirements over the years ahead -- industry estimates suggest \$8 billion in the next ten years -- will involve a continued influx of U. S. funds. This U. S. investment will undoubtedly come in the future, as in the past, from individuals who wish to share confidently in the potential development of the Canadian oil industry, and from oil companies who look to Canadian resources as an important potential source of supply for their petroleum operations. The very many U. S. oil companies, large and small, engaged in Canadian oil exploration and development are indicative of this interest. Paralleling the close industrial ties is a technical cross-fertilization between U. S. and Canadian companies that contributes importantly to the progress of both countries' industries.



TABLE 15

ESTIMATED BOOK VALUE OF INVESTMENT  
IN THE CANADIAN PETROLEUM INDUSTRY, 1955

(Millions of Canadian Dollars)

Principal Activity of Companies <sup>a</sup>	Country of Ownership			Total
	Canada	United States	United Kingdom and Others	
1955	1,001	1,634	135	2,770
Exploration and Development Co's.	408	863	29	1,300
Refining Co's.	477	601	105	1,195
Marketing Co's.	47	9	...	56
Transportation Co's.	69	149	1	219

a Classification according to major industry branches is based on the principal (not exclusive) activity engaged in by reporting companies.

Source: Dominion Bureau of Statistics, Annual Review of Balance of Payments.

27. The close integration of the Canadian and U. S. oil industries is important from still another respect, that is, the essentiality of U. S. markets over the long run to Canadian oil development. The Canadian industry is young, growing, and with great potential still before it. The U. S. industry is relatively advanced. New oil supplies can be wrested from its sedimentary basins only at the cost of intensive efforts and with continuously diminishing returns to the effort expended. Thus, Canadian crude will come to represent an important source of supply, just as U. S. markets will have to represent a significant outlet for Canadian crude. The Royal Commission's report on Canada's Energy Prospects, for instance, sees exports to the United States at 1.6 million barrels daily in 1980, out of total Canadian production of 3.0 million barrels per day (p. 139).

28. While this long range perspective on U. S. demand for Canadian crude is promising, the immediate outlook is clouded by the uncertainties associated with the commercial considerations of refineries and the import policy of the U. S. government. These have already been discussed in detail. If the uncertainties can be resolved, and the cost of waiting is not too burdensome, then the Canadian producing industry may look to the export market for the demand that must support future production --





TABLE 16

ESTIMATED BOOK VALUE OF INVESTMENT  
IN THE CANADIAN PETROLEUM INDUSTRY, END OF 1955

(Millions of Canadian Dollars)

Companies Controlled in:	Country of Ownership			Total
	Canada	United States	United Kingdom and Others	
Canada	493	58	1	552
United States	474	1,562	18	2,054
United Kingdom and Others	34	14	116	164
TOTAL	1,001	1,634	135	2,770

Source: Dominion Bureau of Statistics, Annual Review of Balance of Payments.

and the development of Canadian crude oil at something like the rate that available resources would support. But if the uncertainties are not resolved, the shortfall in demand for Canadian crude would be reflected in continued restrictions on production, and would inevitably tend to inhibit the incentives for development -- with appreciable retardation in the rate of growth of the producing industry.

29. Whether these prospects would be inimical to the producing industry -- and to the broader interests of Canadian economic development -- is a question that can be answered only on the basis of Canadian perspectives and Canadian judgments. If so, then a conscious policy would have to be pursued to expand the market for Canadian crude eastward into Montreal -- a policy by the producing industry to make its crude competitive against foreign supply; and a public policy that supports the producing industry by establishing a preference for the use of Canadian crude in the east as a matter of national interest.

Some Aspects of Policy  
Associated with the Montreal Market

30. A public policy that actively supported the movement of Canadian crude to Montreal would have to derive from the general purpose of



encouragement "in order that our resources may be utilized to the maximum advantage by the Canadian people."\* Whether such a policy should be pursued and the shape it might take are, of course, the proper concern of the Canadian government. We can only indicate some considerations that may bear on the issues involved.

31. The specific problems of the oil producing industry have been dealt with in detail. There is the potential for tremendous growth that is inherent in available resources. But requirements within existing markets would over the years through 1965 fail to support the potential rate of development. An expansion of export markets in the United States is a logical next step in the advance of the market perimeter for Canadian crude. We would only repeat again that if the uncertainties of that expanded export market, or the cost of postponing development until that expansion is realized, are sufficiently compelling, then a solution to the economic difficulties of the producing industry by the projection of Canadian crude into Montreal may become a matter of public concern.

#### The Balance of Trade

32. Beyond the specific problems of the producing industry, there are broader aspects of national interest involved, with respect both to Canada's balance of trade and Canada's tariff policy. In 1956, Canada showed an unfavorable balance on merchandise trade of \$734 million. At the same time, crude oil imports of 290,000 barrels daily -- whilst the province of Alberta alone had unutilized capacity of almost precisely that amount -- cost Canada some \$271 million. An increase in Canadian crude exports to the United States, as a means of opening up Canada's shut-in production, could play a significant role in the balance of trade. The replacement of foreign crude by Canadian crude at Montreal would equally tend to alleviate substantially the unfavorable trade balance.\*\*

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\* The Hon. John G. Diefenbaker, from a "New National Policy", quoted in The Wall Street Journal, December 5, 1957.

\*\* In this respect it is noteworthy that the significance for the balance of trade of moving Canadian crude to refineries in British Columbia was cited as a factor in speeding construction of Trans Mountain Pipe Line. "Further, any deferrent in the construction of the pipe line would retard a saving of at least \$40,000,000 a year presently being expended on foreign oil imports." Board of Transport Commissioners, Judgment in the matter of the application of Trans Mountain Oil Pipe Line Company, December 13, 1951, p. 5.





33. It should also be noted that retardation in the rate of development of the Canadian oil producing industry, because the trend in production is adversely affected by market limitations, would have repercussions on the inflow of foreign capital -- a factor that in the past has contributed substantially to Canada's overall balance of payments. While these considerations alone may not be decisive in the determination of Canadian policy, they could be significant in striking a balance between the costs vs. benefits associated with the movement of Canadian crude to Montreal.

34. The competitive problems of establishing Canadian crude in Montreal have already been discussed in Part II. Briefly, Canadian crude would have to overcome a cost disadvantage of about 25 cents per barrel in order to achieve pro forma equality with Venezuelan crudes. This could be accomplished by lower wellhead prices, or a reduced pipeline tariff, or a combination of the two.\* It could be facilitated by an import duty that reduces the advantage of foreign crudes in Canada.

#### Import Duties

35. The questions raised in the consideration of a Canadian import duty on crude oil are neither simple nor entirely obvious. Beyond the immediate effects of a duty are further implications -- especially for costs at successive stages of production and consumption. To begin with, there is the disparate position of Canadian and U. S. crudes in each other's markets. The United States imposes a tariff on all foreign crudes at the rate of 10.5 cents per barrel for light oils down to 25° API and 5.25 cents per barrel for crudes of 24.9° or heavier. Canadian crudes now entering the U. S. Northwest or Midwest must carry that duty as an added cost to the refiner-purchaser. In looking to further markets in the United States, i. e., in the Chicago or Detroit-Toledo refining area, Canadian crude finds that its competitive disadvantage consists in large measure of the import duty that it must carry.

36. At the same time, U. S. crude may enter Canada free of duty. Thus, the small flow of, say, Illinois Basin crude to Sarnia, or even the potential flow, establishes a competitive cost at that point which Canadian crudes must approximate. Canadian wellhead prices are then a net-back from a competitive delivered price at Sarnia. If a Canadian duty were to be levied, it would raise the cost of U. S. crude at Sarnia by the amount

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\* See pp. II-20, 22 for details.



of the duty and thus permit Canadian crudes to be competitive at comparably higher wellhead prices. But the following implications should be noted. (a) Higher wellhead prices would mean higher crude costs to Canadian refineries from Toronto to Vancouver, with upward pressures on product prices all along the line. (b) Higher wellhead prices would be reflected in the competitive position of Canadian crudes in U. S. markets. (c) The duty would also be carried by non-U. S. crudes being imported into eastern Canada, but this aspect of the question will be treated separately below. Thus, while the existence of a U. S. tariff and the absence of a Canadian tariff is an important factor in the relative level of wellhead prices in the two countries, the competitive position of Canadian crude in existing or potential U. S. markets would only be improved by the elimination or waiver of the U. S. duty; it would not be helped by the imposition of a Canadian duty at this time.

37. The U. S. duty has a further impact upon Canada, aside from its direct effect upon the cost of Canadian crude in the United States. As was pointed out in Part II,\* Venezuelan crudes that move into eastern Canada also move in quantity into the U. S. East Coast. There they have to be competitive with the main stream of U. S. crudes from the Gulf. Thus, their f. o. b. prices tend to compensate for the U. S. tariff to the extent necessary to make them competitive with U. S. supplies -- and they are available for lifting as Canadian imports at the same f. o. b. prices without having to carry a Canadian import duty when they arrive at Montreal.

38. In the event that Canadian crude actively seeks a market outlet in Montreal, this factor becomes a disability in its competitive position as against imports of foreign crudes. At such time, an import duty could take on quite different implications than when the market perimeter for Canadian crude is at Sarnia. An import duty equal to that of the United States, for example, would offset the negative effect of the U. S. tariff on foreign crudes being imported into Canada. To that extent it would improve the competitive position of Canadian crude at Montreal and facilitate the penetration of the Montreal market. And if Montreal then became the new market frontier for Canadian crude, the effect of the Canadian import duty on costs to Canadian refineries along the line would depend on collateral adjustments in wellhead prices and pipeline tariffs. If the Canadian duty were matched by reductions in wellhead prices and transportation charges, costs to Canadian refiners west of Montreal could remain unchanged. Thus, a 25-cent disadvantage for Canadian crude at Montreal would be more than overcome by a 10-cent duty coupled with 10-cent reductions in crude prices and pipeline tariffs.

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\* Page II-17.





39. The effect of a duty would, of course, be carried as higher crude costs by Montreal refiners.\* But this would presumably be part of the price paid to establish the competitive position of Canadian crudes. At the same time it is noteworthy that product prices throughout eastern Canada already reflect Canadian import duties levied on petroleum products, and to that extent, refiners marketing in the area where imported products are a significant source of supply benefit directly from tariff protection (at Most-Favored Nation rates amounting to about 18 cents per barrel of refinery output). So long as eastern product prices have a ceiling set by the cost of imported products (and already reflect those costs), higher crude costs at Montreal -- be they of Canadian crude or foreign crude, due to a crude oil tariff or other reasons -- are not apt to be passed on to the consumer in the form of higher prices.\*\*

40. The competitive position of Canadian crude in Montreal would also be improved by any reduction in pipeline rates. Previously, it was shown that a telescoping of pipeline rates, coupled with a reduction in well-head prices, could enable Canadian crude to reach Montreal competitively without adversely affecting the crude costs of Canadian refiners along the line. It should also be noted that Canadian crude would be competitive if transportation costs could be reduced from the 3.7 cents per 100-barrel miles that is now implied in the Interprovincial rate structure to 2.75 cents per 100-barrel miles, a figure that is approximately in line with the operating experience of large-diameter, long-distance lines in the United States and well within the range of rates referred to in the Royal Commission's report.\*\*\* But the special problems and possibilities associated with crude oil transportation in Canada are discussed in detail in following sections.

41. At this point we have to refer back to the more formidable obstacle confronting Canadian crude in the Montreal market, that is, the

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\* It is of interest that Canadian crude oil duties are established under Tariff Item 267A at the general rate of 1 cent per gallon, 1/2-cent per gallon at Most-Favored Nation rates, and 1/3-cent per gallon British Preference. Under 267D, crude oil imported by refiners may be exempt, and that exemption was recently extended until January 31, 1959.

\*\* At the same time it should be noted that lower crude costs should in time, and as the area becomes self-sufficient with respect to its product requirements and product imports cease, be followed by a reduction in final product prices. Thus, while a crude oil import duty is not apt directly to affect consumer prices in eastern Canada to the extent that import parity governs product prices, in the long run it could be a factor bearing on the allocation of resources and the costs of production and consumption.

\*\*\* op. cit., p. 348.



possible commercial preference of refineries in the area for foreign crude, even should Canadian crude be available at competitive prices. Access to the foreign production of international companies with which Montreal refineries are affiliated offers opportunities of profit that Canadian crude cannot match. So long as this is the case for the area as a whole, no individual company could reasonably afford to switch to Canadian crudes no matter what other considerations it may wish to defer to. On the other hand, an effective public policy that promoted the movement of Canadian crude into Montreal would place all refining companies in the same position. That position would undoubtedly be less advantageous to integrated international operations than were foreign crudes to move freely into eastern Canada. It might even be less advantageous to Canadian refinery operations at Montreal -- but need not be if Canadian crude is made competitive. These considerations would have to be balanced against the benefits that would derive from an expansion in the markets for Canadian crude and the development of Canadian oil production at a rate more closely in line with its potential. Economic considerations that may extend well beyond those of the oil industry itself, questions of security and of foreign relations could also be involved -- all of these being the unique concern of the Canadian government.

42. Should such a policy seem desirable, its implementation would undoubtedly be determined by what is most congenial to Canadian practice and procedure. Canadian undertakings under GATT and established foreign trade relationships would be important considerations. The United States -- whose practice with respect to a similar problem may or may not recommend itself to Canadians -- has acted to protect eastern markets for its domestic crude against excessive foreign crude imports by setting individual "quotas" for importing companies and calling upon them voluntarily to comply. Thereby, the domestic producing industry is supported by voluntary action of the refining industry, even though compliance by individual refiners involves the foregoing of potential advantages in each instance.

### Transportation

43. The key to market expansion of Canadian oil has been in crude oil transportation -- the provision of physical facilities at a transport cost that enabled Canadian crude to reach further refining centers in large and continuous flows in competition with alternative supplies. Transportation costs are already a very important element in the laid-down price of Canadian crudes; they become increasingly important as more distant markets are contemplated, which could only be reached in





competition with other crudes. Transport costs now represent 21 per cent of the delivered price of Redwater crudes at Sarnia. This is a considerably higher percentage than for East Texas crude at Sarnia, or for Rocky Mountain and Venezuelan crudes in markets which determine their wellhead prices. Only in the case of Middle East oil which is being marketed competitively on the U. S. East Coast are transportation costs of greater importance.

44. The major Canadian trunk lines have originated as facilities in which refining companies have played a major role, though (in contrast to most U. S. lines) a minority of shares is publicly held. Jurisdiction over lines crossing interprovincial or international boundaries is vested in the Dominion Government, while each province exercises control over lines wholly within its borders. Construction of lines is authorized only after extensive hearings by the respective authorities that the proposed project is in the public interest. This involves availability of adequate reserves, market outlets and financing. While there are legal provisions for the designation of pipelines as common carriers, and as such subject to administrative review of rate schedules, this has not been done in the case of major Canadian facilities. The operations and earnings of these lines have not been subjected to further regulation once permission for the project has been granted.

TABLE 17  
RELATIVE IMPORTANCE OF TRANSPORTATION COSTS  
IN LAID-DOWN CRUDE OIL PRICES

(Dollars Per Barrel)

	Wellhead Price <sup>a</sup>	Transport Costs	Laid-Down Price	% Transport Costs
Redwater-Sarnia <sup>b</sup>	2.67	0.71	3.38	21
East Texas-Sarnia	3.25	0.40	3.65	11
Wyoming-Wood River	2.98	0.45	3.43	13
Vene. -U. S. E. Coast	3.05	0.25 <sup>c</sup>	3.30	8
Per. Gulf-U. S. E. Coast	2.10	0.95 <sup>c</sup>	3.05	31

a 35° API.

b Canadian dollars.

c At USMC-45 per cent.



## Review of Pipeline Rates

45. The average tariff charged for long distances by the Inter-provincial Pipe Line (3.7 cents per 100 barrel-miles) is somewhat higher than that for the most modern large-diameter lines in the United States. The comparatively higher rates of the Interprovincial appear to stem largely from the line's historical development. In particular, the construction occurred at a time when the Canadian oil industry was still in the very early stages of growth so that knowledge about reserves was limited and forward planning for market requirements was difficult; and when very large diameter pipe was not available, necessitating the use of 16, 18, and 20-inch line. Only the Superior-Sarnia segment was originally built of 30-inch diameter pipe. In addition, interim facilities were provided as the line moved ahead in steps, which subsequently had to be written off.

46. The Trans Mountain Pipe Line's tariff is far above that of Interprovincial (6.2 cents per 100 barrel-miles). This line has had to incur unusually high construction costs for geographical reasons. Further, the line suffered serious initial delays in attaining projected rates of throughput, and it has been exposed to wide fluctuations in its rate of operations since then, because of the uncertain offshore demand for Canadian crude. It is noteworthy, however, that its tariffs remained at their original levels until now while in its prospectus the company envisaged substantial reductions with increased rates of throughput. A 5-cent tariff reduction has been announced effective January 1, 1958, but this was apparently required to maintain the competitive position of Canadian crude at refineries in the Pacific Northwest in the face of abnormally low tanker rates.

47. Pipeline tariffs for various Canadian feeder lines show wide divergencies in rates per barrel-mile. These appear to reflect chiefly differences in size and capacity, and, in some cases, rate of utilization. In several instances, rates have been considerably reduced from their original levels with increases in throughput.





## Implications for Wellhead Prices

48. As was noted above, Canadian crude oil prices are generally determined on the basis of netback realizations from shipments to Sarnia in competition with U. S. crudes.\* The pipeline tariffs of Interprovincial and most feeder lines thus have a direct impact on Canadian wellhead prices.

49. It does not necessarily follow, however, that Interprovincial's operating costs uniquely determine its Edmonton-Sarnia tariff. The line's costs are allocated over a wide variety of movements over both long and short hauls. The revenues necessary to support its investment may be obtained from a variety of tariff structures. In fact, as Table 18 indicates, there are considerable differences, under Interprovincial's present tariff structure, in the barrel-mile charges for carrying oil between different points. While these may reflect, at least in part, respective operating costs, this factor in general has been only one among a number of considerations involved in pricing transportation services. Indeed, the establishment of a competitive position for Canadian crude at Sarnia was undoubtedly a consideration in the development of the tariff schedule, as it could be in reviewing the tariff schedules should Canadian crude seek a further outlet in Montreal.

TABLE 18  
TARIFF RATES PER 100 BARREL-MILES,  
INTERPROVINCIAL PIPE LINE

<u>Distance (Miles)</u>	<u>Approximate Rate per 100 Barrel-Miles (Cents)</u>
Under 300	7.0
300-500	5.5
650-900	4.5-5.0
1,000-1,100	4.0
Over 1,100	3.7-3.8

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\* A major exception are medium gravity Saskatchewan crudes from the Fosterton area moving into the St. Paul refining center.



50. The tariff charged by Trans Mountain Pipe Line, under present conditions, does not affect the level of most Canadian crude prices, since the price of crude oil in the Puget Sound area is a derived one. It is a significant factor, however, in determining the competitive frontier of Canadian crude, as against both alternative crudes and products refined from other crudes.

### Future Expansion

51. Most Canadian pipelines appear to have a potential capacity well above present throughput, particularly if additional looping and pumping capacity is installed. Thus, the requirements of existing markets can probably be handled for some years to come. If Canadian crude is to realize expanded market outlets, however, in either direction, increased pipeline facilities will be required.

52. Trans Mountain has in progress an increase in throughput capacity to 240,000 barrels per day. This figure could probably be further increased to at least 400,000 barrels per day with full-length looping, sufficient to handle all foreseeable needs of British Columbia and Puget Sound refineries, even for 1965. However, if large-scale shipments to the West Coast should materialize in the 1960's, the construction of a second line might well become necessary.\*

53. The capacity of Interprovincial is also being increased to enable the line to handle 235,000 barrels per day out of Edmonton (where the line has already been looped, but additional pumping facilities might still enlarge capacity) and 331-343,000 barrels per day between Regina and Superior (which must be close to ultimate capacity). Tentative calculations indicate that these capacities should be approximately sufficient for requirements in 1960. For later years, however, a greatly increased flow is indicated. In 1965, for example, as Toronto requirements build up, requirements between Cromer and Clearbrook may amount to 500-600,000 barrels per day, far in excess of indicated capacity. Thus, a major

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\* In this connection, West Coast Transmission has announced that it is prepared to construct a crude oil line from the Peace River area to Vancouver as soon as market potential and the scope of crude oil reserves are known.





program of pipeline expansion will be involved to carry the eastward flow of Canadian crude by the early Sixties. Should that expansion be projected so as to meet only the readily identifiable requirements of existing markets, then a penetration of the Montreal market would necessitate further expensive construction.

54. In the past, the programming of Interprovincial was inevitably constrained by the uncertain resources and markets of a then-young producing industry whose reserves and potential were considerably less well established than now. For the future, with the potential rate of development contingent less on physical than on economic uncertainties, more forward-looking planning should be possible, provided the incentives and support to pipeline expansion are forthcoming. The possible differences in operating costs -- and therefore in rates and in advantages to refiners and producers -- can be roughed out by the following illustration. A small-diameter line, designed for low throughput, obviously runs into higher costs at expanded operations than if a larger line had been designed. Conversely, a large-diameter line involves higher costs at low throughput than if a smaller line had been designed. But the increment of unfavorable operating costs is appreciably greater in the former case. If expectations warrant, and the period of deferred expansion in throughput is not too great, the economics of scale weigh heavily in favor of forward planning.

TABLE 19

COMPARATIVE COSTS OF CRUDE OIL TRANSPORTATION\*

	Throughput (Barrels Per Day)		
	<u>100,000</u>	<u>200,000</u>	<u>300,000</u>
22" line	Optimum	10% greater than 26"	60% greater than 30"
26" line	5% greater than 22"	Optimum	15% greater than 30"
30" line	13% greater than 22"	1% greater than 26"	Optimum

\* Based on Rice Institute Pamphlet, Costs of Operating Crude Oil Pipelines, April 1954.



55. In the Royal Commission's volume on Canadian Energy Prospects, it is suggested that "delivery of a light oil over modern long distance 30-inch pipeline, operating close to capacity, can be accomplished for around 2.0 cents to 3.0 cents a barrel for every 100 miles." (p. 347) It was pointed out above that a tariff slightly less than 3 cents per 100-barrel miles would enable Canadian crude to reach Montreal competitively. Tariffs of Canadian crude lines range considerably higher than these figures. And while this comparison need not imply any criticism of current pipeline operations and practices, given the timing and problems of past construction, it still poses a challenge for the years immediately ahead.

56. The programming of transportation facilities in the near future -- where and when, capacities, costs and rates -- will have a direct and vital bearing on the prospects of the producing industry. In the past, the long distance pipelines have been largely planned and operated as facilities in which the major participation has been by refiners. In the context of their economic impact, they are obviously vested with a much broader interest.

#### Pipelines and Public Policy

57. In view of the vital role that pipeline transportation plays in the development of Canadian oil (and gas) resources, it is not surprising that both the provincial and Federal governments have shown a broad concern for many aspects of pipeline operation.

58. Although Canadian pipeline tariffs and earnings are not subjected to administrative regulation, the significance of pipeline policies and rates to the wellhead price of producers has found expression in the decisions of the Board of Transport Commissioners. In the matter of competing applications by Westspur Pipe Line Co., S. & M. Pipeline Ltd., and Trans-Prairie Pipelines of Canada, Ltd. for leave to construct crude oil gathering and trunk facilities from Midale, Saskatchewan to a junction with Inter-provincial at Cromer, Manitoba, the Board specifically noted the following:

\* \* \* The principal difference between the three applicants was in the sponsors of the three companies and in the form in which the sponsorship was expressed in the company to be concerned with the actual construction and operation of the pipe line.

Westspur is backed by a group of fourteen companies including such experienced major oil companies as





Shell Oil Company, British American Oil Company Limited, Canadian Gulf Oil Company, spearheaded in respect of management by Imperial Oil Limited. The foregoing group constitutes the majority of producers in the territory concerned and are possessed of a preponderance of the known production and potentially producing acreage in the area. There was evidence that this group controls 92.5 out of 137 producing wells in the area, or approximately 68 per cent, . . . .\*

Trans-Prairie envisaged the fiscal operation of the line so as to provide to the equity shareholders a return of 7 per cent on all capital invested. The reward to the sponsor of the operation would be in the form of less expensive equity stock and, to all holders of the common shares, the spread between the cost of debt capital and the proposed return.

S. & M. submitted a very similar structure, resting on the same underlying philosophy. Both of the aforementioned applicants submitted schedules, showing proposed tariffs based on certain given throughputs that would produce these results.

The approach of Westspur Pipe Line Company was somewhat different, and in particular no provision was made for special advantage to any one sponsor. Their viewpoint was clearly outlined by Mr. McGibbon in answer to my questions in the course of the hearing: "Their" (the producers') "main concern is to protect or to ensure the most economical and efficient operation of the company and to net back the highest price for crude oil at the well."

The Board held that while all three applications were meritorious, the Westspur application was to be preferred; and in the light of the published judgment, a basic consideration was the policy and prospective rates of the Westspur sponsors in holding out the promise of maximum contribution

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\* While the Board identified the sponsors as crude oil producers, it is equally true that they constitute major Canadian refiners. This identity of interest, as refiners with direct access to owned-production has undoubtedly played a major role in the rapid development of production in southeast Saskatchewan and in Westspur throughput.



to both the marketing of production and the wellhead prices that might be commanded.

59. The government has also acted to facilitate pipeline construction on various occasions.\* In the case of major interprovincial lines, it has granted exemptions from tariffs duties on imported pipe, thus effecting considerable construction cost savings. At the present time, Trans Mountain is reportedly seeking such tariff exemption on 30-inch pipe which must be imported from the United States -- which would represent a saving of some \$1,100,000.

60. The specific problems of pipeline policy are, of course, now in the hands of a Royal Commission on Energy, among whose terms of reference is the following:

\* \* \* the problems involved in, and the policies which ought to be applied to, the regulation of the transmission of oil and natural gas between provinces or from Canada to another country, including, but without limiting the generality of the foregoing, the regulation of prices or rates to be charged or paid, the financial structure and control of pipe line corporations in relation to the setting of proper prices or charges, and all such other matters as it is necessary to inquire into and report upon, in order to ensure the efficient and economical operation of pipe lines in the national interest; \* \* \*

In view of the broad nature of its coming inquiry, it is to be expected that the critical importance of pipeline construction and pipeline operations to Canadian oil and gas development will receive exhaustive consideration by the Royal Commission.

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\* The government has also acted to support the construction of natural gas pipelines. In the case of Trans-Canada, the government undertook the direct construction through a Crown corporation, of a 675-mile section eastward from the Manitoba/Ontario border, the section to be leased to and operated by Trans-Canada and subsequently purchased by it. In addition, an \$80 million interim loan by the government to Trans-Canada permitted an earlier start of construction than if the pipeline company had first to complete its financing arrangement. In each case, support of the government directly facilitated earlier access to a market outlet that was vital to the further development of oil and gas resources. That support also served to lower effective costs, and therefore the basis on which transportation rates would have to be set.





61. In considering the competitive problems of establishing Canadian crude in markets beyond its present perimeter, the construction of pipeline facilities which would operate at minimum tariffs becomes a key consideration. This would be true whether Canadian crude sought its market in California, in the Midwest, in Montreal, or a combination of these potential outlets. It would be equally true whether it involved expansion of Trans Mountain or Interprovincial facilities or the construction of new pipelines.

62. Since a major element in the cost per barrel mile of pipeline operations is the level of throughput, forward planning could effectively reduce costs and hence pipeline charges when larger volumes are realized. But, as noted above, somewhat higher costs may have to be incurred during the early stage of operations. While these considerations could be reflected in the commercial and financial planning of private pipeline operations, they are more apt to be effective when public policy actively supports a design of transportation facilities that is oriented to the broad interest in future resource development.

63. Furthermore, the private financing of major pipeline facilities must always be contingent on throughput agreements on the part of refiners who will purchase Canadian crude. The disabilities confronting Canadian crude in the California market have already been referred to. We would only add here their relevance to possible commitments on the part of refiners. Purchase arrangements for domestic crude in California are traditionally based on term contracts between refiners and producers, in contrast to the practice of monthly nominations in major producing areas East of the Rockies where there is prorationing similar to that of Alberta. Thus, California producers are free to operate at maximum efficient rates; and total domestic production is absorbed locally. Supplementary supplies on advantageous long term contracts can be readily obtained from Eastern Hemisphere (and Venezuelan) sources. In contrast, a California refiner is unable to enter into long term arrangements with individual Canadian producers, although, while productive capacity is available, he could expect to obtain quantities of Canadian crude on an ad hoc basis at posted prices whenever the need arises. Thus, there is every incentive for California refiners to regard Canadian crude as a balancing factor with respect to fluctuations in crude requirements.\*

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\* This is illustrated by the supply arrangements for a Washington refinery. A major oil company is supplying that refinery's requirements for 39° gravity crude from Canada, Venezuela or Qatar at suppliers' option. Early in December, delivery of Qatar crude was reported, supplanting Alberta oil.



Under such circumstances, it is difficult to visualize California refiners entering into throughput agreements for Canadian crude such as would lend themselves to effective planning for new or expanded pipeline facilities westward. Only if Canadian crudes were granted a preferential status -- under expressed and continuing U. S. import policy -- could the position of Canadian oil in the California market be firmly established.

64. Similar problems of equal difficulty confront the movement of Canadian crude to Montreal and the eastward expansion of pipeline facilities. With Montreal refiners finding strong commercial incentives in foreign crudes, there is no immediate inducement to link western Canadian production with Montreal refineries via Interprovincial. Neither Interprovincial, nor any alternative pipeline company, would be able to establish a transportation link unless throughput commitments were obtained at the eastern terminus. Thus the transportation problem is subsidiary to the marketing problem. But should the national interest -- including not only the obvious desires of producers to expand their markets, but the broader concern with maintaining incentives for resource development and its significance to investment, employment, the Canadian balance of payments and the national security -- militate in favor of a movement of Canadian crude to Montreal, then that same national interest might encompass such support as would contribute to the competitive position of Canadian crudes against foreign oils and make the pipeline expansion feasible.











